THE NEWSWEEKLY OF INFORMATION SYSTEMS MANAGEMENT
November 19, 1990 · Vol. XXIV · No. 47 · 154 Pages · $2/Copy · $48/Year

COMPUTERWORLD

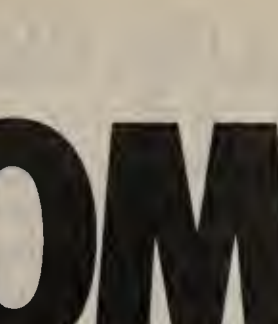
D&B defies naysayers

Merged rivals ride out first-year bumps

BY NELL MARGOLIS and SALLY CUSACK
CW STAFF

NATICK, Mass. — When the deal was announced a year ago this week, many industry observers said it could not be done.

But done it is — and successfully, by most accounts. Once-bitter software rivals McCormack & Dodge Corp. and Management Science America, Inc. are now a $450 million applications giant called Dun & Bradstreet Software. The new entity appears to have retained the loyalty of the merged firms' customer bases — at least for now.



CEO Imlay *pulled D&B team together*

Getting there "wasn't easy," said D&B Software Chairman and Chief Executive Officer John P. Imlay Jr. last week, "and it wasn't always fun." Turning onetime adversaries into a team was the year's most daunting challenge, he said.

The challenge was compounded by the reality of laying off some 380 employees — representing approximately 9.5% of its combined worldwide work force — in its first nine months and fighting nasty legal battles with M&D's founder and former president, Frank Dodge.

However, the challenge the firm faces on its first anniversary could be even more formidable: that of moving beyond survivor to become a player in software markets where the competition is

Continued on page 8

Repetitive stress claims soar

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Claims for repetitive motion disorder, including the painful ailments suffered by intensive computer keyboard users, increased by 28% in the private sector last year, the government said last week.

A U.S. Bureau of Labor Statistics report on 1989 injuries said repetitive motion injuries now account for slightly more than half of all the nation's job-related illnesses.

The agency said the injuries are most prevalent in the automobile manufacturing and meatpacking industries. Although no specific data for office environments was reported, independent studies indicate complaints from keyboard users are significant and are drawing the attention of service industries.

Occupational hazards

Repetitive motion disorders, often linked to intensive keyboard use, accounted for 52% of all occupational illnesses in 1989

	1988	1989
Total occupational illnesses	240,000	284,000
Repetitive motion disorders	115,000	147,000

Number of reported illnesses

Source: U.S. Bureau of Labor Statistics

The injuries are leading to lost productivity and higher worker's compensation costs, as well as lawsuits against computer systems vendors and expensive workplace renovations, experts said.

US West, Inc. responded to government and union complaints by embarking on an eight-year ergonomics program that is expected to cost $13.5 million, according to spokeswoman Robin Baca.

Baca said the regional telephone company has spent $1.6 million since 1986 on medical costs associated with 240 cases of repetitive motion disorders

Continued on page 142

Software trails server rocket

BY RICHARD PASTORE
CW STAFF

IBM entered the fray last month with its Personal System/2 Model 95. Then came Advanced Logic Research, Inc. with a machine that is supposedly compatible with Compaq Computer Corp.'s Systempro. Last week, a battalion of new recruits joined up, including Grid Systems Corp. and Zeos International Ltd.

But if this is the launch of a high-end personal computer server war, then the troops are inadequately armed, according to industry observers.

"Until the software comes along and we get a good multiprocessor operating system, there's nothing in the software driving us" to buy high-end servers, said Melvin Boyer, director of MIS at Louisiana-Pacific Corp. Boyer is using AST Research, Inc. servers based on the Intel Corp. 80386 chip.

"We still use the 386 servers because, so far, there's been relatively small advantage for going to the 486," added Claude Rankin, MIS manager at Deloitte Touche in New York.

Continued on page 143

Factory integration a hedge against economic pressures

BY ELISABETH HORWITT
CW STAFF

DETROIT — The economy may be in the pits, but a growing number of manufacturers believe improved use of coordinated information systems has left them better prepared than they were during the last recession and more able to catch, if not surpass, foreign competitors.

Several attendees at last week's Autofact '90 show said they have moved beyond talking about coordinating information sharing across different stages of the product cycle to actually doing it. As a result, they said, they have been able to boost quality and reduce product development cycles.

One such success story comes from Federal-Mogul Corp.'s oil seal operations. Two years ago, the group discovered from its own research that its two largest competitors — one

Continued on page 4

Deep-sea cable failure reroutes users

BY JOANIE M. WEXLER
CW STAFF

A trans-Atlantic fiber-optic cable has been out of commission for several weeks, although many of its users may be unaware of the disruption.

The low profile of the dysfunctional TAT-8 fiber link — victim of an angry Mother Nature — is a tribute to the suppliers' disaster recovery prowess. But it has been an inconvenience for S. C. Johnson & Son, Inc., commonly known as Johnson Wax, which unfortuitously timed the start of a TAT-8 trial to coincide with the outage, according to Nick Cottrell, director of network services. Cottrell said Johnson Wax is looking to replace its overseas satellite communications with fiber and that "TAT-8 is dead, and AT&T isn't telling us why."

TAT-8 is a trans-Atlantic fiber-optic cable owned by a consortium of 22 carriers and vendors, including 35% interest holder AT&T. MCI Communications Corp., IBM and the Deutsche Bundespost are among the other partners.

The consortium shares TAT-8 support and repair responsibilities, and AT&T was on call at the time of the outage. In addition to satellite, TAT-8 backup is provided over copper lines and bandwidth on PTAT-1, a competing fiber link from U.S. Sprint Communications Co. and the

Continued on page 14

COMDEX

- Joining a small group, IBM unveils a 486-based portable. The pricey model seems likely to attract a small group of demanding users.
- Microsoft's Bill Gates offers his vision of a new age of more useful and more usable computer products.
- A variety of writeable optical disc products was rolled out onto the show floor.
- IBM exec talks up the company's multimedia game plan.

Full Comdex/Fall '90 report on pages 143-145

INSIDE

Executive Report — The search for improved productivity intensifies. Page 101.

Technology Analysis — Reviewers say PC Tools Deluxe is a lot of tool for the money and give Norton Commander solid marks overall. Page 49.

Navistar comes close to signing up an IBM/Perot Systems partnership in an outsourcing deal but opts to stay in-house. Page 12.

NEWSPAPER

IN THIS ISSUE

NEWS

4 **Lotus** forms a consulting group whose goal is to aim CIM arrows at battle-scarred user companies.

6 A faulty component crashes a small percentage of DEC VAX 6000 units.

8 Long-distance provider **MCI** is consolidating its domestic divisions — and staff.

10 **AT&T** opens the door to applications such as full-motion videoconferencing with the first switched T1 private-line service offered by a carrier.

10 **Prime** is making a comeback, showing increased revenue and net income over last year for its fiscal third quarter.

12 Navistar rejects outsourcing proposals from both **EDS** and **IBM/Perot Systems.**

14 Ten technology innovators and leaders receive the 1990 Medal of Technology.

14 **Unisys** introduces its first line module card to support both T1 and E1 transmission rates.

143 **Microsoft** President Bill Gates calls vendors to seek a common long-term vision at Comdex/Fall '90.

144 Here today and here to stay: IBM multimedia advocator Michael Braun argues that multimedia is indeed affordable.

Quotable

"The general feeling at this point is that there has been more talk than actual change."

SCOTT DAVEY
FAIRCHILD
FASTENER GROUP

On D&B Software one year after its formation.
See story page 1.

SYSTEMS & SOFTWARE

27 Wait 'n' see: **Bull HN** customers are wary but hopeful regarding the firm's attempt at improved customer service.

PCs & WORKSTATIONS

43 Mail order and superstores are fast becoming popular alternatives to traditional storefront PC dealers.

47 User-friendly **Ceisar Plus**, an optical disc-based application, lets small to medium-size banks archive transactions at a fraction of the usual cost.

NETWORKING

61 The **U.S. General Services Administration** is charging full-speed ahead with its plan to make data encryption available to users of the new FTS-2000.

MANAGER'S JOURNAL

77 The burden of responsibility for maintenance is falling increasingly on the shoulders of IS managers in this era of open systems.

COMPUTER INDUSTRY

113 The program launched by the **U.S. Department of Defense** to reduce paper volume and cost is having far-reaching effects on other industries.

EXECUTIVE REPORT

101 Information systems departments seek an accurate measure of their performance.

IN DEPTH

111 How to chill out during hot times. By Alan J. Ryan.

DEPARTMENTS

6, 142 News Shorts
18 Advanced Technology
22 Editorial
82 Book Review
88 Calendar
123 Computer Careers
134 Marketplace
138 Training
141 Stocks
146 Trends

The 5th Wave

"ALRIGHT, WHICH ONE OF YOU CLOWNS IS RESPONSIBLE FOR THURSDAY'S DOWNTIME?"

EXECUTIVE BRIEFING

■ **Repetitive motion injuries are skyrocketing,** forcing companies to implement involved and often expensive programs to prevent them. The injuries, commonly associated with frequent keyboard use, now make up more than half of all job-related illnesses. But experts say an ounce of prevention is worth a pound of cure, and ergonomic improvements have productivity benefits as well. **Page 1.**

■ **Buying new systems** does not automatically improve productivity unless the right problem is being fixed. Companies are finding that technology's benefits are becoming more elusive, and some expensive failures have dampened management's enthusiasm for the computerized magic bullet. Experts say companies need to concentrate on analyzing processes more completely than ever and applying new kinds of cost/benefit criteria to justify the solution. **Page 101.**

■ **Some AT&T customers still aren't aware** that the carrier's TAT-8 transatlantic fiber-optic cable has been out of commission since the end of October. That's partly a tribute to the effectiveness of backup alternatives, but some users are reporting increased response times. **Page 1.**

■ **Cornell University is testing** an "electronic library" that lets users retrieve and combine computerized text and images as easily as they would pull books off of library shelves. **Page 18.**

■ **I486-based servers are hot,** but a lack of software to exploit the more powerful chips has some users biding their time in the 80386 camp. **Page 1.**

■ **What-you-see-is-what-you-*need*-to-get** will be the next stage in PC software evolution, Microsoft Chairman Bill Gates said last week. He said the industry has to build standard architectures for combining objects from multiple sources and applications into a single, transparent user view. **Page 143.** Microsoft will take its shot at leading the charge on Dec. 10, announcing details of an object-oriented compound document interchange architecture. **Page 144.**

■ **It's been a rocky year,** but generally a successful one, for D&B Software. Customers say support and enhancements have been solid, but D&B Software still faces the thorny issue of carrying out a major product redesign in the future. **Page 1.**

■ **Outsourcing is not cheap,** as Navistar found out. The company decided not to outsource after learning the concept wouldn't save it money. **Page 12.**

■ **Mind numbed by meetings?** One software authority advises picking up the pace by focusing on what could go wrong rather than what's going on in general. **Page 77.**

■ **A lot of responsibility** falls on IS shoulders when it comes to prosecuting computer crime. The steps you take to snag your suspect will influence the outcome of the case. **Page 134.**

■ **Small banks are saving** as much as $2,000 per month in archiving costs by using an optical disc-based alternative. Instead of printing out reports, banks can store data on the disc and retrieve only what they need. **Page 47.**

■ **The mainframe baptism of fire** doesn't suit some DEC VAX 9000 customers, who are complaining they were not prepared for up to a 10-fold increase in software license fees. **Page 6.**

■ **On-site this week:** Missouri S&L sidesteps the industry crisis and focuses on using technology to better manage its loan payments. **Page 36.** It's client/server to the rescue as a global broadcasting service downsizes its scheduling application from a mainframe to OS/2-based PCs. **Page 31.** Boston investment firm turns to high-speed scanning to put paperwork on-line. **Page 41.**

Introducing The Financial Software That's Behind America's Most Successful Companies.

From the canyons of Wall Street to the Sun Belt to Silicon Valley.

Wherever you find successful companies you'll find something else:

The Masterpiece® series of financial software.

CA90s

CA's Computing Architecture For The 90s protects and enhances the value of every CA software solution.

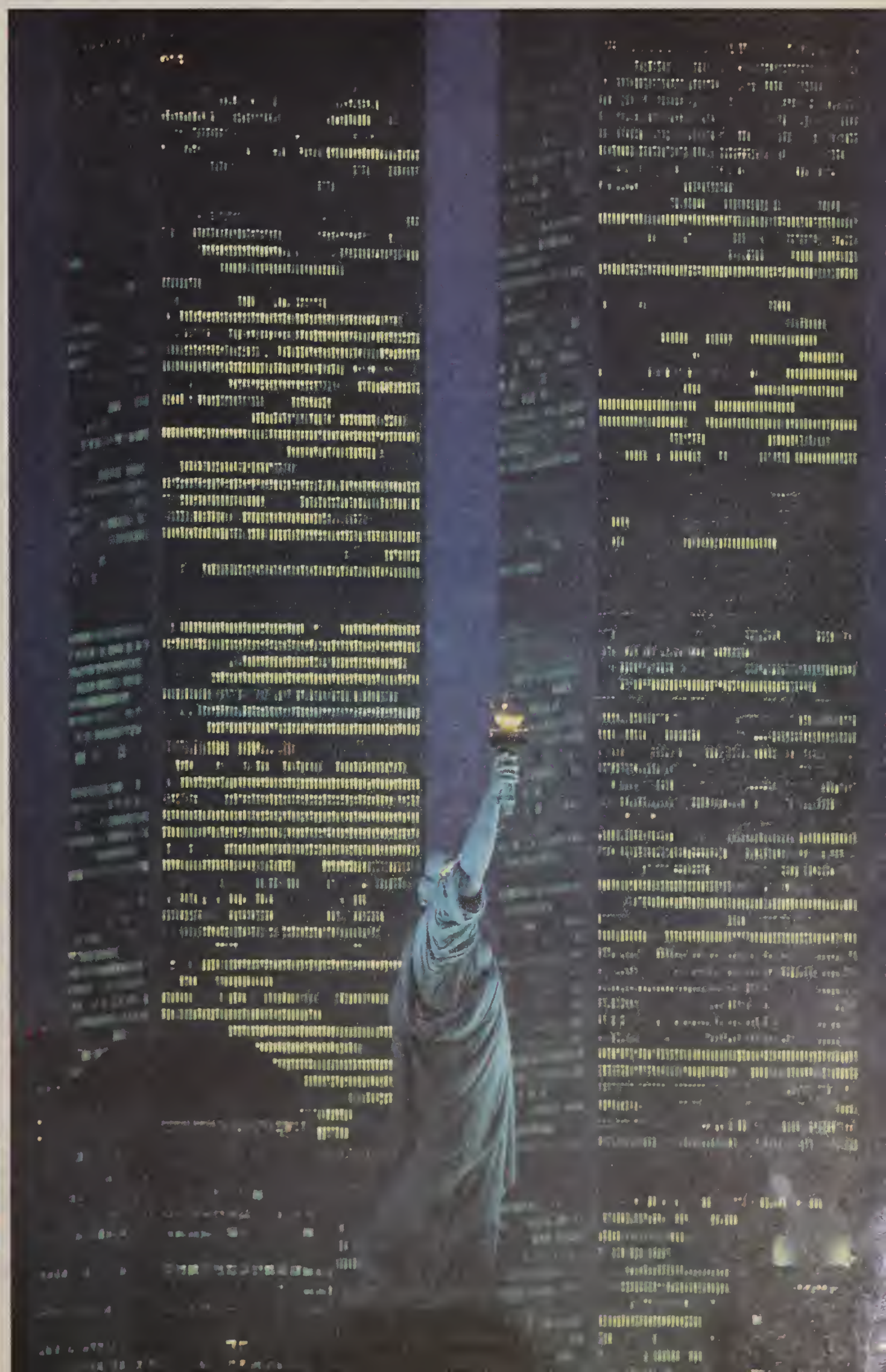
It's the most advanced and integrated accounting solution ever developed. Across all of your major hardware platforms (IBM mainframe and midrange, Digital VAX, Unisys, and Data General) Masterpiece delivers a single, comprehensive, approach to all of your financial needs. An integrated series of high-performance Masterpiece modules address: General Ledger and Financial Reporting, Purchasing and Payables Management, Receivables and Credit Management, Fixed Asset Accounting, Order and Inventory Management, and Project and Labor Cost Tracking.

Because it's built on top of a relational foundation, Masterpiece delivers superior integration and performance. It's also easily tailored to your company's specifications and offers a unique custom reporting facility along with distillation, analysis, data manipulation and outstanding presentation tools.

Call 1-800-645-3003 for complete information on Masterpiece. Call today and learn the difference between software for accounting—and software for success.

COMPUTER ASSOCIATES®
Software superior by design.

© 1990 Computer Associates International, Inc.,
711 Stewart Avenue, Garden City, NY 11530-4787.
All trade names referenced are the trademarks or registered trademarks of the respective manufacturer.



Integration

FROM PAGE 1

German, one Japanese — "were bringing new sealants to market in less than half the time of our best efforts," said Larry Smith, a technical services manager at the Detroit-based, global automotive parts manufacturer.

The competitors were able to respond to a new customer query with a product prototype within six to 10 weeks, while Federal-Mogul was taking 18 to 20 weeks, Smith said.

The company's $200 million oil seal division found that much of its product development inertia stemmed from the fact that incoming product design specifications were being passed from sales to engineering to production in paper form, said Alan Johnson, the division's general manager.

Too often, when the specifications reached manufacturing, "they'd say, 'We can't make what you designed,' " he added.

To the rescue

Ernst & Young was brought in to help develop an information system based on Informix Corp.'s relational database management system that would "give everyone immediate access" to the latest information about a product, including the latest changes, Johnson said.

The new system enabled the division to cut its product development cycles by 75%, from 20 weeks to 20 business days or less in most cases, Federal-Mogul spokesmen said. As a result, the oil seal division once again leads the industry in customer responsiveness, according to recent customer surveys, Smith said.

"Our competition has moved, too, but we plan to keep our edge by cutting the time down to 10 business days in the 1992 time frame," he added. Federal-Mogul plans to start evaluating the system for other divisions next year, Smith said.

Quality control is another key competitive area where U.S. manufacturers cannot afford to continue lagging behind overseas competition, according to Armand Feigenbaum, president of General Systems Co. and an originator of the "total quality control" concept. Research by the Pittsfield, Mass.-based firm shows that in 14 major industrial countries, eight out of 10 buyers "put quality at equal to or greater than price" in their purchasing decisions, Feigenbaum said.

The General Systems Quality Improvement Index, measured in 1990 gross national product (GNP) terms, indicated that "widespread implementation of total quality throughout the United States economy" would result in an increase of approximately 7% in the U.S. GNP, according to Feigenbaum.

Here again, IS integration is enabling some leading-edge U.S. companies to clean up their act. For example, Allied Signal Corp.'s Autolite Spark Plug Division has used Netwise, Inc.'s object-oriented networking software to send real-time production data from factory control units to Oracle Systems Corp. RDBMS servers. Various users can then access the data they need using SQL forms and Lotus Development Corp.'s 1-2-3, according to Autolite project engineer Richard Sturgeon.

The system helped the spark plug division realize a productivity increase of 13% in 1989, making it the most productive unit in Allied Signal's automotive sector, Sturgeon said.

Sikorsky Aircraft was plagued by "high scrap and rework rates," a "flat quality curve" as well as customer dissatisfaction until it implemented a quality management system with the help of Digital Equipment Corp. that has reduced product defects by 26% during the past year, according to Sikorsky statistical process control supervisor Tony Lawrence.

The resulting system uses Salerno Industries' SPM+ software to monitor production in real time and capture data on out-of-control conditions and defects. Historical data is stored on DEC's RDB/VMS database, where it can be accessed by engineers and designers.

Worth the cost?

Implementing better manufacturing information systems can be costly. Federal-Mogul's project is expected to take about 2½ years and will cost thousands of internal man-hours in addition to $1 million to $1.5 million in fees to Ernst & Young, said Reuben Slone, a spokesman for Ernst & Young.

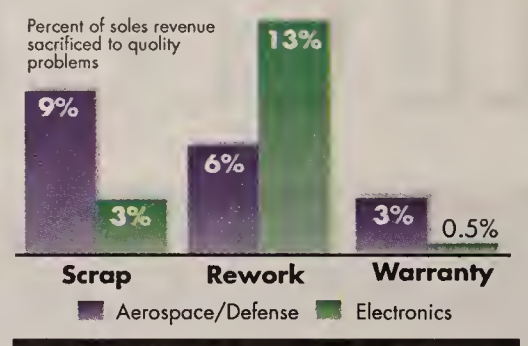
The toughest technical problem, several implementors agreed, is identifying what information various user groups need and then figuring out where that information resides.

"We had to model the current [production] process, then find out where the information is stored — which could be on a mainframe or a personal computer database that one person has owned for years but no one knew it," Slone said.

Another potential stumbling block is gaining the cooperation of various systems groups, particularly between IS and engineering and manufacturing systems. Those two sides "often don't communicate well" at Allied Signal, Sturgeon said: "They have different problems, priorities and time frames and use different acronyms."

Getting it right

Quality problems generate high costs, according to a survey of 30 manufacturers



Source: Coopers & Lybrand CW Chart: Doreen St. John

Lotus consulting unit offers a CIM-plification service

BY ELISABETH HORWITT
CW STAFF

DETROIT — Computer-integrated manufacturing (CIM) for the masses was the banner under which Lotus Development Corp. rode into the CIM marketplace last week.

The company announced at the Autofact '90 conference here that it had formed a Lotus Consulting Services Manufacturing Practice Group whose target will be companies that have put off implementing CIM because of "war stories, lack of user-friendliness and high costs," group director Nick Losole said.

"We're already on the engineering, inventory management and financial desktops; now we're going for the factory floor," Losole said. Lotus can put together a production CIM system within three months and then turn it over to users, together with Lotus' 1-2-3 macros to maintain and modify the system on their own, he added.

However, some industry sources questioned whether the new Lotus organization has the breadth and depth of experience, as well as the right products, to become a full-scale CIM systems integrator.

Easy audience

Lotus could well find an audience among "people distributing [programmable logic controllers] who don't have a clue how to operate PC-based data collection and control systems for simple data analysis," said Bruce Richardson, a vice president at Advanced Manufacturing Research, Inc. based in Cambridge, Mass.

However, the group "will operate at the Lego, not the Brooklyn Bridge, level" of a full systems integrator that "could compete with [companies] like Arthur Andersen," Richardson said.

Allied Signal Corp.'s automotive sector hired Lotus to develop an "activity-based cost system," based on 1-2-3, that determines costs "not just on the basis of production, but also on support and administration" and other activities that are assigned to each product, according to David Priestley, director of cost management at the firm.

The firm chose Lotus primarily because the vendor was quick to understand the concepts and requirements of the application, Priestley said. Contributing to the decision was the fact that "virtually all of our operations use 1-2-3, particularly in finance," and the fact of the package's global availability, he added.

While Lotus has yet to provide Allied Signal with a factory-floor-based CIM system, the automotive parts maker is discussing with Lotus' manufacturing group the idea of co-developing a factory-floor information management system based on Lotus' @Factory, according to Gilbert Steffand, the division's manager of CIM.

Announced at last year's Autofact, @Factory interfaces with a variety of factory-floor devices using Manufacturing Automation Protocol 3.0 and other standard and proprietary protocols. The product has been available only through value-added resellers until now. Lotus announced last week that it will now be selling @Factory directly.

The Manufacturing Practice Group is the first offshoot of the Consulting Services Division that Lotus announced last March. A company spokeswoman refused to say how big the new group's staff is but added that "there are over a dozen in the consulting services group" and that several Manufacturing Practice staff members are from General Motors Corp.

CORRECTIONS

A headline in the Nov. 12 issue incorrectly referred to Dbase IV. The headline should have referred specifically to the Dbase IV Professional Compiler.

An article in last week's edition erroneously identified Sybase, Inc.'s relational database product as the "main database" for Citicorp in New York. While Sybase has been chosen as the standard for one of the bank's financial divisions, relational database management systems from Oracle Systems Corp., Informix Corp. and Ingres Corp. are used in various other divisions.

COMPUTERWORLD

Editor in Chief
Bill Laberis
Executive Editor
Paul Gillin

News Editor
Peter Bartolik
Assistant News Editor
James Connolly
Senior Editors
Clinton Wilder, Management
Elisabeth Horwitt, Networking
Patricia Keefe, PCs & Workstations
Michael Alexander, Advanced Technology
Rosemary Hamilton, Systems & Software
Nell Margolis, Industry
Maryfran Johnson, Systems & Software
Senior Writers
Joanie M. Wexler
Richard Pastore
Staff Writers
Sally Cusack
Carol Hildebrand
New Products Writer
Gary Byrne
Research Coordinator
Kevin Burden

Features Editors
Glenn Rifkin
Joanne Kelleher
Senior Editors
Michael L. Sullivan-Trainor
Joseph Maglitta
Lory Zottola
Mary Grover Brandel
Donald St. John
Senior Writer
Alan J. Ryan
Associate Editor
Cathleen A. Duffy
Researchers
Jodie Naze
Kim Nash
Intern
Derek Slater

Chief Copy Editor
Joyce Chutchian
Assistant Chief Copy Editor
Catherine Gagnon
Features Copy Editor
Kimberlee A. Smith
Copy Editors
Christopher Lindquist
Alice Lesch Kelly
Kelly E. Dwyer
Steven J. Condon

Design Director
Nancy Kowal
Graphics Designer
Tom Monahan
Graphics Specialist
Paul Mock
Design Assistant
Marie J. Haines

Assistant to the Editor in Chief
Linda Gorgone
Editorial Assistants
Lorraine Witzell
Stefanie McCann
Rights and Permissions Manager
Sharon Bryant
Back Issues
Margaret McIndoe

News Bureaus
Mid-Atlantic
201/967-1350
Johanna Ambrosio, Senior Correspondent
Washington, D.C.
Mitch Betts, National Correspondent
202/347-6718
Gary H. Anthes, Senior Correspondent
202/347-0134
West Coast
415/347-0555
Jean Bozman, Senior West Coast Editor
J.A. Savage, Senior Correspondent
James Daly, Senior Correspondent
Jim Nash, Correspondent
Maura J. Harrington, Correspondent
Marilyn Scott, Editorial Assistant
Midwest
708/827-4433
Ellis Booker, Bureau Chief
Michael Fitzgerald, Correspondent

IDG News Service
Penny Winn, Director

Main Editorial Office
Box 9171, 375 Cochituate Road
Framingham, MA 01701-9171
508/879-0700
Fax: 508/875-8931
MCI Mail: COMPUTERWORLD
Subscriptions: 800/669-1002

WHEN THE FORTUNE 500 WANT SORTING EFFICIENCY, THEY DON'T WASTE TIME.

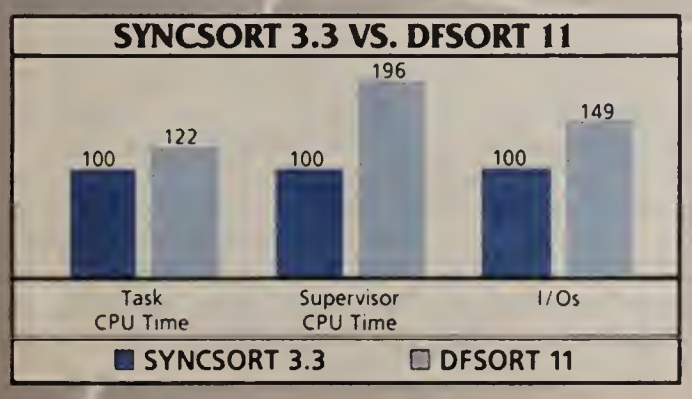
THEY CALL SYNCSORT.

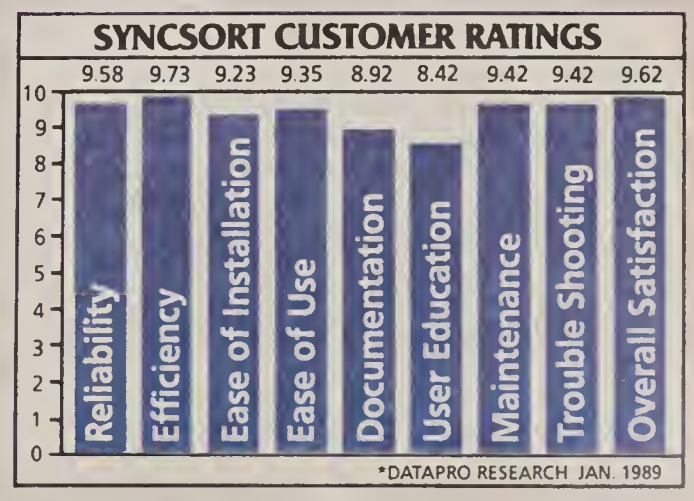
Sorting time can be a costly drain on resources. Which is why most Fortune 500 companies use Syncsort to optimize sorting.

For the most efficient and effective sorting, Syncsort offers a complete solution of software, training courses and performance enhancement services. We act as your partner by evaluating your unique sorting needs and providing a tailored solution of software and services. Our professional services are unconditionally guaranteed. With Syncsort as your sorting partner, you can double your sorting efficiency.

No wonder most Fortune 500 companies have relied on us for over 20 years. They've seen us consistently outperform the competition, making us the leading sort company. They consider Syncsort to be an investment that pays for itself hundreds of times over.

For sorting efficiency, don't waste time. Call your sorting partner: Syncsort.





syncsort INC.

50 Tice Boulevard, Woodcliff Lake, NJ 07675

800-535-3355

NEWS SHORTS

SPA moves ahead on piracy raids

The Software Publishers Association (SPA) filed requests for search-and-seizure permits against two corporations in federal district court last week. Mary Jane Saunders, general counsel for the SPA, said it was unlikely that action would be taken on the search-and-seizure requests until this week, although she added that the Thanksgiving holiday could delay action until the following week. The SPA also filed suits against the two corporations claiming copyright infringement, in the event that the judge should refuse to grant one or both of the search-and-seizure orders. Saunders declined to identify the companies accused of pirating software or where the cases were filed.

. . . . . .

Prime gets stay of injunction

A federal judge in Detroit entered an injunction against Prime Computer, Inc. last week prohibiting the company from continuing to enact a long-standing software distribution "tying" arrangement. However, Prime got an emergency stay of the injunction and said it would file a motion to reverse the verdict. The agreement at issue required purchasers of certain computer-aided design and manufacturing software packages to also procure computer hardware maintenance agreements from Prime. Last month, a jury awarded the plaintiff, Virtual Maintenance, Inc., a computer services company, $25.3 million plus attorneys' fees.

. . . . . .

Comdisco to expand network

The Midwest Division of MCI Telecommunications Corp. in Chicago and Rosemont, Ill.-based Comdisco Disaster Recovery Services, Inc. signed a five-year, $20 million agreement by which MCI will help Comdisco expand its coast-to-coast data network for business continuity services. Earlier, the firms announced they would bundle their respective services in a marketing alliance. They also announced earlier that Comdisco would provide business continuity services for MCI's data centers.

. . . . . .

Aldus delays Windows package

Seattle-based Aldus Corp. has delayed the arrival date of its Persuasion for Windows presentation program from the end of this year until the second quarter of 1991. Vice President of Engineering Dick Mathews blamed the delay on several factors, including gaining familiarity in working with a new code base and extensive compatibility testing.

. . . . . .

Ticket agency seeks power relief

Pacific Gas & Electric has switched Bass/TM Tickets to a new power circuit after repeated power outages have brought the ticket agency's computer network crashing down seven times since early May. A spokesman said Bass/TM, which has 120 outlets in Northern California and Nevada, has lost $75,000 in revenue from the outages, which have taken the firm's $10 million Digital Equipment Corp. VAX-based computer system down for as long as one hour with each occurrence. Bass/TM has moved to cover its bases with the installation of a $144,000 backup power generator and a $50,000 uninterruptible power supply system. Ironically, Bass/TM moved to the new building after the Oct. 17, 1989, earthquake. "But that earthquake did less damage than all of these outages," said frustrated spokesman Doug Levinson.

. . . . . .

NMI on acquisition trail

Network Management, Inc. (NMI) of Fairfax, Va., said it will acquire the assets of Norcross, Ga.-based Net-Tech, Inc. Net-Tech provides systems integration and networking products and specializes in the design and installation of local-area networks for commercial and government customers. NMI, with sales approaching $60 million this year, seeks to become a nationwide network management firm through acquisitions, and Net-Tech is the sixth networking firm it has acquired since 1987.

More news shorts on page 142

VAX 9000 users hit by software shock

BY MARYFRAN JOHNSON
CW STAFF

The backburner issue of mainframe software pricing is heating up for some of Digital Equipment Corp.'s VAX 9000 owners, who are finding their licensing fees and software prices multiplied by as much as 10 times as they migrate applications from smaller machines to their new mainframes.

A C language compiler license that costs $2,500 on a Microvax 3900, for example, costs $25,000 on the VAX 9000. A full-function Decnet license priced at $2,000 for a midrange system is tagged at $9,000 on the mainframe.

"I can sympathize with DEC's need to make a profit, but this is a bit excessive," said John Jones, assistant coordinator of information services for Paws, Inc. in Albany, Ind., which installed a VAX 9210 in August.

"You may have the same five people using the software, but your costs have increased quite a bit for those same five to run it on the bigger machine," Jones said.

He and other customers said they would prefer a wider range of individual user charges, capped at a certain amount per seat, plus more creative "value packs" of software tools and applications.

A DEC spokesman said last week that all software pricing and licensing fees are now under review by the recently established software products group, headed by DEC Vice President David Stone.

Company officials are also well aware of the VAX 9000 customers' concerns about software pricing, which was a key issue discussed at an Oct. 29 meeting of mainframe customers in Palm Beach, Fla. A dozen VAX 9000 users formed a customer advisory board to provide DEC with feedback on their experiences with the machine.

"DEC's software pricing is not acceptable," said Michael Guider, vice president of network and information services for Litel Telecommunications Corp. in Columbus, Ohio. The firm has one VAX 9210 now and will install a 9410 in mid-December.

Guider: *DEC's prices unacceptable*

Guider said his objections to DEC software pricing have sharpened in the past two years as Litel moved into larger Vaxclusters to meet the firm's rapid growth.

"I've consistently told DEC that we're happy with their overall architecture and direction, but if the software pricing strategy does not meet our needs, that can have serious consequences," he said. "I feel strongly that DEC needs to allow its 9000 customers to improve their price/performance ratios, not just maintain them."

DEC has traditionally priced its software licenses by the size of the processor and the number of users, reasoning that the same application running on a faster CPU will be more productive.

George Kerns, vice president of information services at Contel Cellular, Inc. in Atlanta, said he is experiencing less "sticker shock" than longtime DEC customers because Contel has been an IBM mainframe customer for years before the recent addition of its VAX 9410.

"This kind of comes with the turf. The more you buy, the more it costs," Kerns said. "We're not finding DEC's prices that much different from IBM's."

At the advisory board meeting last month, Guider said, he and the other customers gave the VAX 9000 excellent marks for its sheer performance and I/O capabilities, and users have been generally delighted with the quick response from DEC field engineers when a problem arises.

Yet an eager response to a call does not necessarily mean the problem is solved, Jones pointed out.

"Our 9000 was down for two days with a bad cable, and that's unacceptable," he said. "This machine is much more complex than a Microvax, and I don't think our local field people have been provided with the tools they need to diagnose the problem."

Faulty components caused some VAX 6000 outages

BY MARYFRAN JOHNSON
CW STAFF

A flawed board component in Digital Equipment Corp. VAX 6000 computers has caused intermittent and unexplained system crashes at roughly 45 sites, DEC officials acknowledged last week.

"An extremely small percentage" of the installed base of some 12,000 VAX 6000s would potentially be at risk, said Daryl Long, midrange systems product manager at DEC.

"The important thing is we have a fix for the problem if it occurs," Long said.

Evidence that the defect had caused system crashes surfaced last week with publication of a survey of 250 VAX 6000 sites, conducted by Reliability Ratings in Needham, Mass., an independent rating analysis service for DEC equipment.

The survey found that 3% of those VAX 6000 sites had experienced intermittent failures that defied routine diagnostics. Most of the machines experiencing the problem were Model 400s, and users were generally able to restart their systems within 30 minutes.

The defect was traced to a faulty chip on the DWMBA/B board, a bus adapter card that is half of a two-board set connecting the BI bus to the XMI bus.

This is the most serious hardware problem to crop up on the VAX 6000, which industry analysts and customers alike praise as a highly reliable machine. The Reliability Ratings report also noted that the VAX 6000s it tracked during 1.8 million field run hours had 99.8% uptime.

DEC will not recall the problem board or replace it, Long said, unless customers detect trouble.

If the chip does cause a problem, it should show up on a user's error log with the message "Interrupt 60 Errors," Long said. The chip defect is now on a "hot list" at all 800 of DEC's service locations worldwide.

DEC buys this particular chip from several suppliers, but only one of those suppliers apparently did not meet the correct timing specifications, which led to the intermittent failures.

"Once we identified the problem, we purged all our manufacturing stock and field service stockrooms and replaced them all," Long said.

The first customer to discover and report the problem was a manufacturing division of National Semiconductor Corp. in South Portland, Maine, where three VAX 6000 Model 420s joined a Vaxcluster last April.

Operations manager Hal Kolp found that his newly installed 6000s were crashing every three to four days. Even after the suspect board set had been swapped out, the machines would go down again a few days later.

Finally, DEC sent in a team of three engineers to diagnose what had become six weeks of frustrating work stoppages at the semiconductor manufacturing plant.

Supercomputers vie for commercial IS market

BY JOHANNA AMBROSIO
CW STAFF

NEW YORK — Supercomputer manufacturers are vying for a piece of the general commercial information systems market with computers that address concerns such as networking with standard data processing hosts.

This emphasis was evident at the Supercomputing '90 trade show held here last week. Amid the typical conversation about which architecture is best and which computer is fastest — dubbed by one observer as the "macho-flops" debates — were signs that supercomputers are learning the language of IS.

Vendors are concentrating more on providing data management software, high-speed data storage devices, networking and standard versions of Unix instead of relying on proprietary operating systems. Still missing, however, are off-the-shelf general business applications that are written to take advantage of massively parallel architectures.

This attention to commercial IS is driven by survival. "Most of the [supercomputer] suppliers are getting money from the government, either directly or indirectly through contracts," said Michael P. Burwen, an analyst at Superperformance Computing Service in Mountain View, Calif. "With the budget cutbacks, the money is drying up. Some will be put out of business unless they can find enough money to sustain their growth."

Ncube, a vendor in Belmont, Calif., is taking that tack. "Our goal is to make increasing inroads into the commercial market to fund our research and development," said Bill Woo, director of marketing.

One way the company hopes to attract commercial customers is through its relationship with Oracle Systems Corp., also in Belmont. Though Ncube is not owned by Oracle itself, a group of Oracle executives recently invested in Ncube. An outgrowth of that relationship is a version of the Oracle database management system that runs on the Ncube supercomputer at 300 transaction/sec., the same speed as on an IBM 3090, Woo claimed. He said Ncube will also unveil channel connections to IBM and other computers.

Fast as they are, most supercomputers are built to process large chunks of information and are not especially well suited to handle applications that require many transactions going back and forth between a computer's main memory and a data storage device.

To remedy that, vendors are incorporating high-speed data storage devices and data-access schemes. At last week's show, IBM announced a joint development deal with San Jose, Calif.-based Maximum Strategy, Inc. to design a high-speed disk array system for the System/390. The scheme will be based on the High-Performance Parallel Interface (HIPPI) standard. Maximum Strategy's disk-array product family has sustained data-transfer rates of 20M byte/sec.

IBM said it will also develop a HIPPI networking interface with speeds up to 100M byte/sec. The company did not specify when either the disk array or the networking interface would be ready.

In another announcement made at the show, Convex Computer Corp. in Richardson, Texas, and Beaverton, Ore.-based FPS Computing said they will offer Unitree storage-management software with its systems. Unitree, from General Atomics in San Diego, migrates files among different storage devices.

Convex also announced its Application Compiler, which can compile both C and Fortran applications.

Courtin'

Although vendors at Supercomputing '90 are trying to woo more commercial customers, they are not neglecting their bread-and-butter technical users.

Among the announcements for this group were the following:

- Cray Research, Inc. in Eagan, Minn., said buyers of its brand-new XMS minisupercomputers will be able to apply that price as a credit toward Cray's next-generation minisuper, which will be available in the second half of next year.

Ed Masi, senior vice president of marketing, said the pricing incentive will "kick-start our entry into the under-$1 million market."

- Thinking Machines Corp. in Cambridge, Mass., announced an 8G-byte supercomputer with 64,000 processors. It can compile Fortran and C. A version of the High-Performance Parallel Interface network is being developed for the new and existing Connection Machines.
- "Visualization" is the key buzzword for scientific users who want to do exciting things with computer graphics. Virtually every supercomputer vendor on the show floor sported software to help create three-dimensional color graphics and other forms of visualization.

JOHANNA AMBROSIO

Don't buy another 3390
another 3390 another 3390
another 3390 another 3390
another 3390 another 3390
another 3390 another 3390
another 3390 another 3390
until you've tried Innovation's
FREE DASD Management
Report Program....FDRQUERY

Let FDRQUERY Put You Back in Control of Your DASD

With Automatic Backup Recovery (ABR®):

■ You can identify inactive data and archive it in compressed format to both disk and tape.

■ ABR tracks the archived dataset and automatically and immediately recalls the data set when requested by a TSO user or a batch job.

Your choice. You can either keep buying expensive DASD or put ABR in *control* of your DASD.

FDRQUERY EXAMPLE

VOLCNT	DEVICE TYPE	ALLOC TRACKS	BEFORE %ALLOC	AFTER %ALLOC	DAYS SINCE LAST USE	SAVINGS IF ARCHIVED DSN's	TRACKS	%SAVED
6	3380-K	173095	72.44%	52.66%	30	9423	47264	27.30%
				55.81%	60	5296	39722	22.94%
				60.48%	90	4199	28558	16.49%

Call for FREE DASD Management Report Program and FREE No Obligation 90 Day Trial.

INNOVATION® DATA PROCESSING

Available for IBM VS1 and all MVS systems

CORPORATE HEADQUARTERS: 275 Paterson Avenue, Little Falls, New Jersey 07424 • (201) 890-7300

EUROPEAN OFFICES:	FRANCE 01-47-69-15-15	GERMANY 089-439-2053	NETHERLANDS 03240-41660	UNITED KINGDOM 081-905-1266

D&B

FROM PAGE 1

ferocious, the demands are relentless, and customer budgets are shrinking.

The combined company has taken a number of steps in that direction. It has released more than 20 product enhancements, pledged to enhance and maintain both the M&D and MSA product lines in parallel, instituted four new customer support programs, announced a grand future strategy (see story at right), and mounted a generally successful effort to get two warring sales forces marching in sync. It is not enough, the firm's users said,but it is a promising start.

D&B Software has done a "credible" job of getting organized, defining combined goals and stating direction in the wake of the merger, said Scott Davey, assistant controller of systems and planning at Fairchild Fastener Group in Carson, Calif.

"I've been seeing signs that they are doing the right thing. Account reps are now calling people and asking how they can help," said Davey, who is also national chairman of the M&D Accounts Receivable/Millennium user group. "However, the general feeling at this point is that there has been more talk than actual change."

Reebok International Ltd. is "pretty comfortable with everything that has happened," said Mike Cote, MIS project leader at the Stoughton, Mass.-based company, a three-year M&D customer.

"It seems that the individual companies had complementary strengths and weaknesses," said Roger Hesslau, financial and administrative assistance manager at Walgreen Co. in Deerfield, Ill. Saying he's "generally positive" since the merger, Hesslau noted that the technical strength seems to reside with the former M&D product line, while support seems to have improved because of the MSA influence.

"D&B Software is looking good," said Stuart Woodring, an analyst at Cambridge, Mass.-based Forrester Research, Inc. "They've managed to do some impressive things — not the least of which was not blow up in the face of what could have been a violent merger."

But the occasional smoldering resentment lingers at D&B Software. One sensitive item is the way in which Dodge departed from the firm in April. It is not just M&D employees who believe that Dodge was unceremoniously dumped by D&B. A former MSA executive who asked not to be identified said that while the right ends were attained when D&B opted for Imlay to head the new firm, the means left much to be desired.

"The strengths that made Frank Dodge great in the early days of M&D — his brilliance, creativity, nonconformity, personal involvement with the company — turned into weaknesses when it came to running a large company," the executive said. "Like many another entrepreneurial founder, he didn't have the objectivity or the toughness to do what had to be done." However, the executive added, "[D&B] took away Frank's baby, and they didn't even tell him they were going to do it. It shouldn't have happened that way."

Even more disquieting to some industry observers and D&B Software employees is the widely held view that the former M&D is being subtly dismantled.

Touted as a merger of equals, the deal that created the current firm "wasn't a merger of anything — it was the acquisition of M&D by MSA, funded by D&B," said a former M&D executive who asked to remain anonymous. That is not just a sour grapes view from the M&D side, a former MSA executive said: "Absolutely — that's exactly what happened."

While Imlay and other D&B Software executives insist that balance between the two founding firms was sought at all times and is being maintained wherever possible, only two members of the nine-member executive committee came from M&D, and the trickle of M&D talent continues.

"It's unfortunate that M&D hasn't had more impact on the products," said the former MSA executive, who for the first time last year attended a user group meeting of M&D Millenium customers. "In all my years at MSA, I had never seen users so committed to a product."

A busy year at D&B

A year in the life of D&B Software:

- Nov. 20, 1989: The Dun & Bradstreet Corp. says it will buy MSA and merge it with archrival M&D.
- January 1990: MSA President John P. Imlay Jr. named head of merged firm, D&B Software.
- Winter 1990: At user group meetings, D&B Software promises to keep and enhance all M&D and MSA software lines.
- March 1990: Former M&D President Frank Dodge leaves and sues D&B, claiming he was forced out. D&B Software countersues in April and Dodge withdraws suit.
- Winter, spring, summer 1990: D&B Software cuts worldwide work force by about 9.5%; deploys united sales force.
- Autumn 1990: Firm shows Future Architecture blueprint.

Creating a leader

In the earliest days of D&B Software, CEO John P. Imlay Jr. was asked what he considered the most daunting challenge ahead for the new firm. "Technology," he answered without a moment's hesitation. "Finding out where the new software market is going to be and getting ourselves there."

Getting there involves enhancing and maintaining both M&D's and MSA's largely competing product lines while simultaneously developing a new generation of applications that will, by 1993, make up the company's single product line.

The so-called "Future Architecture" D&B line will come with computer-aided software engineering tools built in for user customization.

While it looks to the future, D&B Software plans to shore up its present by plumbing approximately one-third of its resources into strengthening customer service and support.

The success of Future Architecture would topple two of the bigger obstacles standing between D&B Software and its growth goals, said Forrester Research analyst Stuart Woodring. Those barriers are the fact that the company is "still living in a mainframe world" while the users are flocking to the desktop and the waning viability of fielding overlapping, redundant product lines. D&B confirmed that approximately 95% of its current applications portfolio is mainframe-based. "They've got the customer base, the sales force, backing from a parent with a *lot* of money and a concept that the industry is going to go wild for," Woodring said.

The downside, Woodring said, is that the firm is banking on a client/server concept that is not catching fire as rapidly as industry observers thought it would. It's an area foreign to the firm's management, developers and sales force alike, he said.

NELL MARGOLIS

HP earnings decline in fourth fiscal quarter

BY SALLY CUSACK
CW STAFF

PALO ALTO, Calif. — Despite a 10% growth in orders and a 6% increase in net revenue, Hewlett-Packard Co. posted an 18% decline in net earnings for the fourth quarter of its 1990 fiscal year, ended Oct. 31.

"To my mind, this wasn't real surprising," said Jay Ritter, an analyst at Duff & Phelps Investments Research in Chicago. "HP's backlog going into the fourth quarter wasn't all that large, and much depended on how orders went this quarter."

Fourth-quarter net earnings totaled $202 million, or 83 cents per share. This compares with net earnings of $246 million reported in the fourth quarter of 1989, or $1.04 per share.

John A. Young, president and chief executive officer at HP, indicated that the company achieved record orders overall, and growth was broadly based across the HP businesses.

"In addition to year-over-year order growth of 10% for the quarter, orders for the period were also 5% higher than for the third quarter of our fiscal year," Young said. He also noted that, given current industry trends, HP's order growth rate was "particularly notable."

Ritter added that he has had concerns about the firm for some time now, one of the reservations being that HP has been dependent on revenue growth. "If revenues do not increase next year, my concern is that they will not be able to cut expenses fast enough," Ritter said.

Net revenue for the fourth quarter totaled $3.6 billion, compared with $3.4 billion in the corresponding 1989 quarter. U.S. net revenue rose 1%, while net revenue outside the U.S. rose by 10%. As a percentage of net revenue, HP's operating expenses were 37.5%, down from 38.8% from the third quarter of fiscal 1990. Operating expenses rose 11% for the year.

HP's net earnings for fiscal 1990 totaled $739 million, compared with $829 million earned in 1989.

MCI eyes consolidation, 1,500 layoffs

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — Citing the economic downturn, intense competition and the cost of the recent acquisition of Telecom USA, Inc., MCI Communications Corp. said last week it will consolidate its seven domestic divisions into four and will lay off approximately 1,500 employees, or about 6% of its work force, during the next six months.

A spokesman declined to elaborate on a written statement from MCI President and Chief Operating Officer Bert C. Roberts that referred to "negative constraints on the company's financial performance over the next several quarters."

MCI recently reported a quarterly loss of $176 million, its first loss in four years, resulting from a $550 million charge associated with the conversion of its network to digital technology.

Kenneth McGee, program director at Gartner Group, Inc., said the layoffs were not unexpected and did not seem likely to affect service.

The second-largest provider of long-distance voice and data communications services also said it is forming two new units: one devoted to network services for business customers and one to concentrate on sales and service to MCI's residential market.

The new Network Services Division, based here, will be headed by Daniel E. Crawford, previously president of the firm's Southwest Division. An MCI spokesman said the new network service unit will be engineering-oriented and will provide technical support to voice- and data-network operations, primarily for mid-size and large business customers.

Crawford said his network service unit would have operational and maintenance responsibility for the entire network but customer support responsibility for business customers. "We will continue to provide the type of support that our customers expect and deserve," he said.

A new business markets unit, to be headed by Kevin Sharer, will consist of four divisions:

- The Eastern Division, based in Rye Brook, N.Y., will be headed by Jonathan Crane.
- The Southern Division in Atlanta will be under Douglas Maine.
- The Central Division in Chicago will be run by Greg LeVert.
- The Western Division in San Francisco will be under Barent Wagar.

The spokesman said layoffs would come from all MCI units, but Denver and St. Louis would be most affected.

The Problem With Buying Software From A Hardware Company

Once a company gets locked into hardware and software from one computer vendor, it operates at the mercy of that vendor.

Many companies buy and build software that runs on only one kind of computer. Locking themselves into one vendor's hardware. These companies can then find themselves trapped into buying a ten million dollar computer when a one million dollar computer from another vendor would actually do a better job.

These expensive hardware traps can easily be avoided by using the right software.

Oracle software runs on virtually every computer – mainframes, minicomputers, workstations and PCs. From virtually every vendor.

Oracle software lets companies develop applications that run on all their computers. And share data among them as well.

Most important of all, it lets companies exploit newer, faster and cheaper technologies as they emerge.

Call 1-800-633-1071 Ext. 8112 for more information.

We'll tell you how you can move forward without worrying about what you're stepping into.

ORACLE

Software that runs on all your computers.

©1990 Oracle Corporation. ORACLE is a registered trademark of Oracle Corporation. All trade names referenced are the service mark, trademark, or registered trademark of the respective manufacturer. Call 1-800-ORACLE1 for hardware and software requirements.

AT&T beats competitors to switched T1 service

BY ELLIS BOOKER
CW STAFF

BASKING RIDGE, N.J. — AT&T raised the ante for high-speed, wide-area networking last week, becoming the first carrier to announce a switched T1 private-line service.

Among the major applications for high-speed switched services are full-motion videoconferencing, bulk data transfers and on-line access to very large data files such as digitized documents and pictures.

Accunet Switched 1536, which will be available in the second quarter of 1991, provides a 1.536M bit/sec. pathway for customer data. The service follows Accunet Switched 384, a 384K bit/sec. facility AT&T launched at the International Communications Association show in May [CW, May 28]. AT&T said last week it had several unnamed customers beta testing the 384 service.

AT&T tested both services six months ago but is releasing them sequentially because "they are still looking for market demand," said Steve Sazegari, a senior industry analyst at Dataquest, Inc. in San Jose, Calif.

"They also knew they were ahead of the competition and didn't want to price it too high," Sazegari added, noting that AT&T was also the first with a switched 56K bit/sec. service but had cut its price following introductions by MCI Communications Corp. and U.S. Sprint Communications Co. of their own 56K bit/sec. services.

According to Sazegari, the break-even point for AT&T's switched offering as an alternative to a standard T1 will probably be approximately four hours of continual use per day. Above that, he said, customers are probably better off buying a standard private line.

The 1.54M bit/sec. product is more than 27 times faster than AT&T's 56K bit/sec. switched Accunet service but will cost less than 20 times that service's price, according to an AT&T spokesman. Specific pricing is unavailable, however, because a tariff for the Accunet Switched 1536 has yet to be presented to the Federal Communications Commission.

Customers will obtain access to Accunet Switched 1536 from designated AT&T central offices — the same AT&T toll offices supporting the 384K bit/sec. service. AT&T said last week it hopes to have 73 of those locations for the tariffed 384 service by the end of the year.

Like the 384K bit/sec. service, the 1536 offering requires the use of an Integrated Services Digital Network (ISDN) access line; customers will also need a private branch exchange that supports the ISDN Primary Rate Interface.

MCI will be right behind AT&T with its own switched T1 and a switched T3 service, scheduled for availability in the third quarter of 1991. MCI actually announced its Virtual Private Data Services first, at the September Tele-Communications Association show in San Diego, Calif., where it demonstrated a switched T3 circuit connecting a Cray Research, Inc. supercomputer and a Sun Microsystems, Inc. workstation. MCI said its service will not initially require a Primary Rate ISDN access line.

Sprint, which said it is considering such a switched service, currently offers an integrated T1 access partitioning capability that allows users to allocate each of the 24 channels in a T1 line to different circuit-switched services.

Switched 1536, like all of AT&T's Accunet Switched Digital Services, is supported by a dedicated AT&T network control center in Chicago.

Prime posts $58.3M income

NATICK, Mass. — Prime Computer, Inc. posted an operating income of $58.3 million last week, compared with a loss of $7.7 million at this time last year, according to DR Holdings, Inc., the company that acquired Prime in June 1989.

DR Holdings reported a net loss of $34.3 million for the third quarter, which ended Sept. 30, 1990.

According to a statement by James F. McDonald, Prime's vice chairman and chief executive officer, the company has reduced its operating debt by $145 million since January through prepayments and other debt reduction actions.

Prime's revenue for third-quarter 1990 was up 5.8% over revenue for the same period last year, and net income was $20.1 million for third-quarter 1990.

Prime said that it submitted a $25 million payment to its senior bank lenders last month, effectively saving the computer vendor $450,000 in cash interest expense for the fourth quarter of 1990. The bank lenders had originally scheduled the payment for Dec. 31, 1991.

In related news, Robert A. Fischer, president and general manager of Computervision, a division of Prime, quietly left the Bedford, Mass.-based computer-aided design and manufacturing firm last month. Fischer's responsibilities have been assumed on an acting basis by John J. Shields, Prime's president and chief operating officer.

SALLY CUSACK

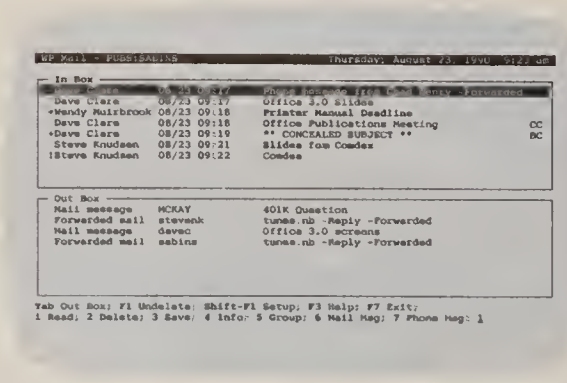
How to send messages without spinning your wheels.

Introducing WordPerfect Office™ 3.0. With services such as E-mail, WordPerfect Office is an easy yet powerful solution for companies who want their network to keep up to speed with the way they work.

WordPerfect Office Mail (Office Mail) puts simplicity at your fingertips. The Office Mail screen shows you everything you need to compose and circulate messages to an individual, a group, or the entire corporation. Since Office Mail is so easy to use, you'll spend less time managing messages and more time doing what you do best.

Office Mail brings you and your company face to face with the power to send messages and up to 100 attached files of any format. You can send carbon and blind copies and keep your messages confidential by using password protection and encryption. With unique tracking capabilities, Office Mail even gives you control over messages that have already been sent. It can notify you immediately when a message has been delivered, opened or deleted. If your mail message hasn't been read, it can be retracted and deleted; or edited and then resent.

WordPerfect Office includes scheduler, calendar and powerful desktop utilities. These combined with our gateway services make it easier than ever to send messages around the world. For more information about WordPerfect Office 3.0 call us at 1 (800) 526-5166.



WordPerfect Office Mail

WordPerfect CORPORATION
1555 North Technology Way Orem, Utah, 84057
Tel: (801) 225-5000 Fax: (801) 222-5077

WordPerfect is a registered trademark of WordPerfect Corporation in the United States.
WordPerfect Office is a trademark of WordPerfect Corporation. ©1990 WordPerfect Corporation.

SATISFACTION GUARANTEED

If you have been searching for a software company that can provide you with a wide range of software solutions, backed up by first-rate support, we invite you to join the over 6,500 MVS, VSE and VM users who have found long-term software satisfaction with SEA. Since 1982, we have been developing products based on your input and backing these products with support you can count on 7 days a week, 24 hours a day. The results have been impressive for both us and our users. With products licensed at one out of every three mainframe sites worldwide, SEA software has set new standards for efficiency and performance. Our over 6,500 licensed users include 9 of the Fortune 10, 85% of the Fortune 500 and thousands of other installations of all sizes and configurations. An equally important factor in measuring our success is our high level of user satisfaction, in which we take great pride.

SEA PRODUCT GROUPS

Operations Automation Group

SEA provides a complete line of operations automation products covering all critical areas. We are the only company that provides such a complete line of operations automation software, backed up by first-rate technical support. With over 2,500 users choosing SEA as their single source for operations automation software, we have assumed a position of leadership in the field. Many users tell us the reason they have selected our products is superior support, as well as our integrated approach to long-term product development.

ODDS/MVS - Unattended Operations, Master Console Management.

MECO - Unattended Operations, Central and Remote Control of Operations, including remote access from a PC outside the data center.

$AVRS - Sysout, Syslog and JCL Management, Viewing, Archival and Retrieval.

TRMS - Report Management and Distribution.

CSAR - Automated Job Scheduling MVS-VSE-VM.

TRAMS - Data Transmission Management System.

QUICK TRAN - Data Compression/Decompression for increased data transmission between mainframes or mainframes and PC networks.

SYNTHETIC JOBSTREAM - Functionally verifies operating system and hardware changes before production implementation.

KEYS - Problem/Change, Hardware/Software Inventory and Help Desk Management System.

JCLCLEAN - Reformat, modify, document JCL automatically, including SMS conversions.

DASD/Data Management Group

SEA's DASD/Data management tools are corporate standards, used by over 4,500 MVS data centers. We guarantee significant savings in DASD costs.

PDSFAST - High speed DASD/PDS Management, 100% IEBCOPY replacement.

FASTGENR - High speed replacement for IEBGENER.

PDSUPDTE - High speed global JCL/PDS editor.

VCF/L - ListC replacement, VSAM tracking and reporting.

VCF/M - Automated VSAM optimization and allocation.

SUPERZAP - Online Zap Utility to access and modify otherwise unavailable areas of datasets.

Application Development/ Performance Measurement Group

SEA's Application Development and Performance Measurement products, used at over 1,000 locations, aid in application development for CICS and database systems, and monitor program/system performance and operational dependencies.

PRO-2 - Application Development MVS-VSE.

OHF - Automate Creation of CICS Help Windows.

MRC - Automated Online Color Graphic Reports analyze system activity for data center managers.

SEA has products that will save budget dollars and increase efficiency, whatever your installation's size or configuration. No other software company even comes close to matching our combination of a comprehensive line of high-quality software solutions, backed up by the highest levels of technical support. We invite you to join the thousands of installations who have found long-term software satisfaction with SEA products.

For further information regarding any of the above call 1-800-272-7322.

SEA™ SOFTWARE ENGINEERING OF AMERICA®
WORLD HEADQUARTERS • 2001 Marcus Avenue, Lake Success, New York 11042
Tel: (516) 328-7000 1-800-272-7322 Telex: 6973556 Fax: (516) 354-4015

Products Licensed In Over 40 Countries

How IBM, Perot lost out

BY CLINTON WILDER
CW STAFF

HOUSTON — It pitted IBM and H. Ross Perot's new company against Perot's old company for a billion-dollar contract — and it might have been the biggest outsourcing deal that never happened.

In June of this year, Chicago-based Navistar International Transportation Corp. ended a nine-month evaluation of outsourcing with the decision to keep its information systems function in-house.

For different reasons, Navistar rejected the bids of Electronic Data Systems Corp. (EDS) and an alliance of IBM and Perot Systems Corp., which were rumored to be discussing merger possibilities during the same time frame.

Navistar dropped EDS from consideration before IBM/Perot, but in the end, neither vendor offered significant enough advantages to justify outsourcing, said E.O. "Skip" Stout, vice president of IS and services at the $4 billion truck and components manufacturer.

EDS offered only 10% annual savings and inadequate applications development direction, according to Stout. IBM/Perot, which did meet Navistar's goals for outsourcing applications development, would have actually increased Navistar's annual IS costs by $10 million.

"If it was level [with current IS spending], we would have done it," Stout said at an outsourcing conference held here last week by Profit-Oriented Systems Planning Program (POSPP), a Carrollton, Texas-based IS executive research consortium.

Navistar was also not comfortable with IBM's "people plan," which would have transferred half of Navistar's IS operations' employees to a new IBM/Perot subsidiary devoted to the contract.

The employee transfer would have been similar to IBM's much-publicized arrangement with Eastman Kodak Co., and it was the Kodak deal that partially motivated Navistar to consider outsourcing. Other motivations were corporate clamps on capital spending, a need to better coordinate business units' IS and a letter from one vendor claiming it could cut the firm's $80 million annual IS budget in half.

In an effort to simplify the process, only IBM and EDS were considered. IBM brought Perot Systems in as a partner in response to Navistar's concerns that IBM was fairly new in the facilities management business.

Despite initial management attempts to keep the outsourcing consideration under wraps, word leaked out to Navistar employees within three weeks after the process began in late 1989. Stout joked that the "quality" of the rumor mill could qualify for the Malcolm Baldrige Quality Award. "We should apply for the Baldrige on our grapevine," he said.

Stout said Navistar's experience proved what many POSPP conference speakers said: The outsourcing evaluation process itself can lead to dramatic improvements in IS effectiveness.

He said the evaluation resulted in better cooperation among analysts, programmers and users. Most advantageous of all, the magnitude of the decision focused the attention of senior management on the importance of IS as never before, Stout said. Stout now reports to Navistar's president and chief operating officer instead of to finance.

EDS signs $90M deal with CCIS

BY CAROL HILDEBRAND
CW STAFF

DALLAS — In a move aimed at expanding its presence in the transportation industry, Electronic Data Systems Corp. (EDS) has augmented its outsourcing role at Cummins Engine Co. by signing a 10-year, $90 million facilities management contract with subsidiary Cummins Cash and Information Services, Inc. (CCIS).

According to CCIS President Leo Krulitz, although the firm hopes to realize some cost savings in the future, that was not the driving factor behind the decision. "We've been having a hard time keeping up with computing capacity," he said. "Our principal interest was to make sure that we have all the capacity we need to serve our customers."

CCIS, which provides electronic funds transfer and fuel services for trucking firms, is the second-largest firm in the industry after Comdata Holdings Corp.

The contract strengthens the ties between EDS and Cummins Engine, a manufacturer of diesel engines and other components for the trucking industry. EDS took over the management of the company's Columbus, Ind.-based computer operations center about one year ago.

Computer operations, programming and telecommunications efforts will be handled by EDS, Krulitz said, but he does not anticipate any big changes. "EDS' data processing center for CCIS will remain right here in our offices," he said.

Roger Still, an EDS spokesman, said the agreement represented another step in the firm's attempts to target the transportation industry. "We don't have much in trucking so far, but we are definitely working toward expanding our role in the entire transportation industry."

More Preferred Stock

At Data Preference, you're assured of filling all your computer needs—from a single source. Because, whatever your Apple® preference, we have more of it in stock.

Blue-chip stock—like the new Macintosh® IIfx—Apple Computer's fastest, most powerful Mac® ever. Plus, more of the high-performance Macintosh IIci. Offering built-in video support, it runs most applications up to 45% faster than the Macintosh IIcx. And we're also well-stocked with the fast and expandable LaserWriter® II.

Having the rental industry's largest, most comprehensive stock of Apple products, however, isn't the only reason so many companies are bullish on Data Preference. We also offer more preferred services and options. Like installation, on-site maintenance and return-to-depot programs. Plus a toll-free number for on-line diagnostics. As well as financial plans that fit your individual needs and personal preference. Perfectly.

So call Data Preference now—and get more dividends on the stock more people prefer.

DATAPreference MicroAge®
Formerly Leasametric Data Communications, Inc.

Northwest 800.343.7368, 415.574.5797 • Southwest 800.638.7854, 818.708.2669
Central 800.323.4823, 708.790.2050 • Northeast 800.241.5841 • Southeast 800.241.5841, 404.925.7980
London 011.44.923.897000. Copyright © 1990 Data Preference Incorporated.
Apple, the Apple logo, Mac, Macintosh and LaserWriter are registered trademarks of Apple Computer, Inc.

Authorized Dealer

Give Them The Face They Know And Love

Applications built using Oracle Tools automatically adapt to multiple user interfaces.

These days, it seems almost every user, department and workgroup has a favorite Graphical User Interface (GUI). Which means developers building applications for entire organizations must spend months rewriting each application for each incompatible GUI.

Unless the applications are built with Oracle Tools.

An application developed with Oracle Tools automatically adapts to the native look and feel of the computer on which it runs. DECstations, Macs, PCs, Suns or any other workstation. Even character and block mode terminals. All without changing a single line of code.

So applications can be deployed across an entire organization's different computers. Without users having to be re-trained in an unfamiliar GUI.

Oracle Tools will support both current and emerging graphical user interface standards. DECwindows, Macintosh, Microsoft Windows, NeXT Step, Presentation Manager, X/Motif, as well as character and block mode terminals. So it doesn't matter who wins the GUI wars.

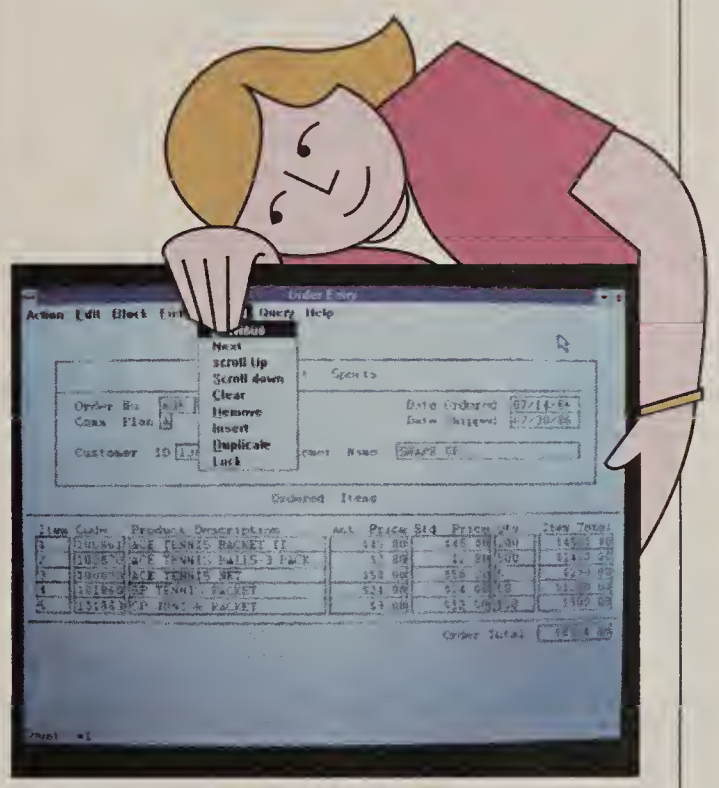
Call 1-800-633-1073, Ext. 8114 and receive the free Oracle Tools Information Kit, illustrating the full capabilities of Oracle Tools.

Because everybody likes to see a familiar face.

ORACLE®

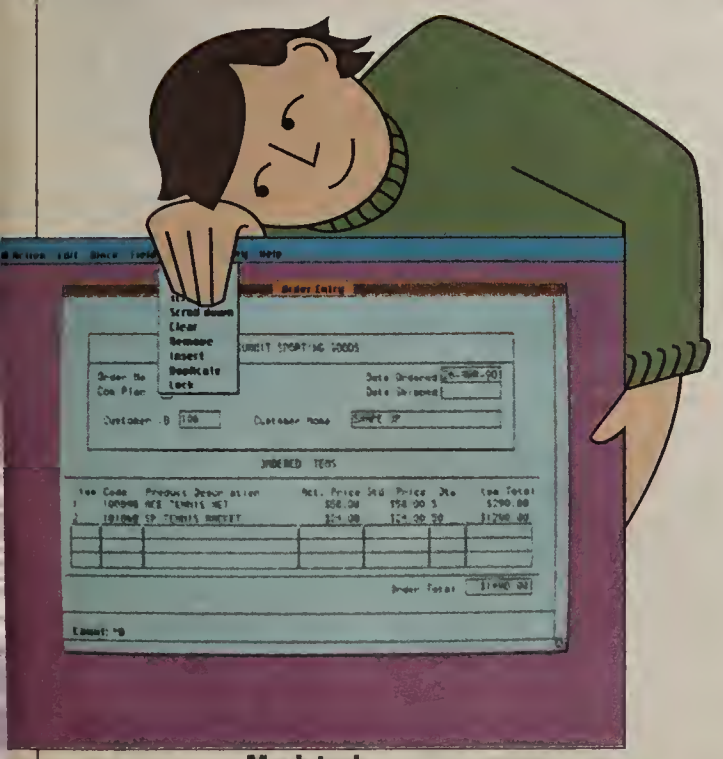
Compatibility • Portability • Connectability

Character Mode



Presentation Manager

DECwindows



Macintosh

3270 Block Mode

Whatever's NeXT

©1990 Oracle Corporation. ORACLE is a registered trademark of Oracle Corporation. All trade names referenced are the service mark, trademark, or registered trademark of the respective manufacturer. Call 1-800-ORACLE1 for hardware and software requirements.

Outstanding innovators lauded

BY MAURA J. HARRINGTON
CW STAFF

WASHINGTON, D.C. — The U.S. Commerce Department last Tuesday honored 10 "outstanding technologists" and one company with the nation's highest honor bestowed by the president for technological achievement.

The 1990 Medal of Technology has been awarded to only 50 people since its establishment in 1980 by the Stevenson-Wydler Technology Innovation Act, according to Commerce Secretary Robert Mosbacher.

First awarded in 1985, the award recognized contributions made by scientists, engineers and companies in improving "the well-being of the U.S. through technological innovation and commercialization," according to the Commerce Department.

Among this year's recipients are John Atanasoff, for inventing the electronic digital computer; Gordon Moore, co-founder and chairman of Santa Clara, Calif.-based Intel Corp., for his leadership in microelectronics innovations of large-scale integrated memories and microprocessors; and Dallas-based Texas Instruments, Inc.'s Jack St. Clair Kilby, for inventing and contributing to commercialization of the integrated circuit and the silicon thermal print head.

Atanasoff is considered by many to be the founder of the computer industry. In 1939, he created a working prototype of a nonprogrammable electronic calculator at Iowa State College.

That prototype was viewed by John Mauchly, who, with J. Presper Echert in 1940, built the Electronic Numeric Integrator and Calculator (ENIAC) computer. In 1972, Atanasoff's creation was the basis of a court decision invalidating the patent for the ENIAC.

Kilby's discoveries *helped build electronics industry*

Moore, now 61, worked with William Shockley, co-inventor of the transistor, on semiconductor process technology before co-founding Fairchild Semiconductor Corp. in Mountain View, Calif., in 1957.

Moore became director of research and development at Fairchild, where the first commercial integrated circuit was produced, and in 1968, he moved on to co-found Intel in order to develop and produce large-scale integrated products, beginning with semiconductors.

Kilby, 77, is well-known for his invention of the integrated circuit, which he developed in 1958, shortly after he arrived at TI to work as an engineer and manager.

He worked at TI from 1958 until 1970, when he took a leave of absence from his job as assistant vice president to become an independent consultant and further explore the use of silicon technology for generating electrical power from sunlight.

Additional honorees

Others honored with the 1990 Medal of Technology include the following: Marvin Camras, for developing and commercializing magnetic recording; Donald Frey, for a range of commercial applications of new technologies and research on technology commercialization; John Mayo, for providing a technological foundation for information age communications and overseeing conversion of the national switchboard network to digital-based technology; and Chauncy Starr, for innovations in energy production, risk assessment, technology transfer and organization of research consortiums.

Unisys announces DCP line modules, front end

BY ELLIS BOOKER
CW STAFF

BLUE BELL, Pa. — Unisys Corp. launched a new family of line modules for its distributed communications processors (DCP) last week, featuring a top-end model capable of T1/E1 data rates.

The high-speed intelligent line module (ILM-20-HS) card is the first from Unisys to support T1 (1.544M bit/sec.) and E1 (2.048M bit/sec.) transmission speeds. It is also the first to sport a four-line interface. The new line modules can be used with Unisys' DCP/30, DCP/35 and DCP/50 front-end processors.

Unisys also announced a new entry-level front end — the DCP/25 — for its 1100/2200 and System 80 mainframes.

The latest front end, which can handle up to 184 lines, is capable of about 30 transactions per second, which is about twice as fast as its predecessor, the DCP/15. By comparison, the top-of-the-line dual-processor DCP/55, which Unisys plans to have out by the second half of next year, will be capable of 230 transactions per second and will handle 750 lines.

A key difference between Unisys' DCPs and IBM's products is Unisys' emphasis on Open Systems Interconnect (OSI) protocols, according to Kevin O'Neill, vice president of network research and consulting at Newton, Mass.-based Business Research Group. "IBM's front-end processor support is very [Systems Network Architecture]-centric," he said. O'Neill estimated that about 20% of Unisys' 7000 front-end processor sites use Transmission Control Protocol/Internet Protocol instead of Unisys' own proprietary Distributed Communications Architecture (DCA).

"At the heart, we still run the DCA architecture, supporting on top of that other protocols," said Brian Pickersgill, DCA program manager. "But in about 1992, we will be native OSI with DCA on top of that." Since its appearance in the late 1970s, DCA mapped to layers one to four of the International Standards Organizations's OSI Reference Model.

Unisys goes on to argue that unlike the hierarchical IBM SNA, its DCA was designed originally for peer-to-peer, multiprotocol networks and so can function even when connections to the mainframe are lost.

Prices for the DCP/25, currently available, start at $31,000; the four-line ILM-20-HS card costs at $12,500.

Failure

FROM PAGE 1

UK's Cable and Wireless PLC.

Steve Wolff, director of the networking division of the National Science Foundation (NSF) in Washington, D.C., uses the service and was unaware of the outage. He ran a test connection to Helsinki, Finland, during a *Computerworld* interview.

"It looks as if they're backing us up with a satellite link, because I'm getting one- to three-second response time," he said. "Over TAT-8, we can connect in a couple hundred milliseconds."

Scandinavian connection

Wolff is linked to the NSF's NSFnet international data network for supercomputer-based research projects. He has a direct link over TAT-8 into Nordunet, a network connecting the five Scandinavian countries.

According to AT&T spokesman Rick Brayall, "Some users may not be aware of the outage, but it's our standard policy to inform customers about service problems. This is because sometimes when you reroute, service degrades. We're upfront about the causes of the problems and we let them know that we're getting to the situation and taking care of it as soon as is humanly possible."

TAT-8 has been inoperable since Oct. 30 because of an electrical fault located in a regenerator — a device placed every 50 miles along the cable to amplify the communications signals, according to AT&T. Restoral has reportedly been delayed by heavy seas and violent winds, which make it difficult for a ship to get to the cable and make the necessary repairs, AT&T said.

The slower response time caused by using copper and satellite technology as backup can inhibit the productivity of some users.

Delays inherent in satellite technology are not good for interactive communications, said Sergio Heker, director of the John Von Neumann Computer Network (JVNCnet) at Princeton University.

"For example, researchers who work on collisions of galaxies need to see them colliding in their time frame," he said. "Supercomputers can process the data fast enough, and the workstation can display it fast enough, but the network speed must keep up with the computers."

Heker added that because of this, JVNCnet is considering a plan to split its load between TAT-8 and PTAT-1 and put Cisco Systems, Inc. routers at each end of the cables. Cisco routers contain the intelligence required to balance traffic loads and reroute traffic in case of failure. The 2-year-old TAT-8 carries 40,000 simultaneous phone calls, outmoding its predecessor, TAT-7, which supported 8,000 calls.

PTAT-1, introduced earlier this year, reportedly carries 80,000 calls. The TAT-8 consortium is currently digging ditches for TAT-9, which will match PTAT-1's capacity and is expected to go live in mid-1991, according to Brayall.

Bell Labs is also reportedly working on the successor to TAT-9, which will use optical amplifying technology instead of electrical power. Though the underwater glass fiber is protected by several layers of polyethylene plastic, Brayall noted that copper sheathing lies beneath the plastic for powering the amplifiers. "An underwater earthquake could cause a rock to break through the plastic. When you have water on copper, you're going to short out," he said.

When the optical amplifying technology emerges, according to Brayall, TAT-9's successor will be capable of carrying "several hundred thousand" telephone calls.

Loren named Covia CEO

Former Apple exec joins travel systems firm

BY ELLIS BOOKER
CW STAFF

ROSEMONT, Ill. — Allan Z. Loren, who left Apple Computer, Inc. early this year, will become president and chief executive officer of Covia Corp., the travel and reservations systems company said last week.

Loren's appointment, which goes into effect on Jan. 1, fills the vacancy created in late June when Barry A. Kotar left Covia to join Minneapolis-based Northwest Airlines as its executive vice president and chief information officer.

Loren *will try his wings at Covia*

In January, Loren resigned as president of Apple USA, where he had reportedly come into conflict with several other top Apple executives [CW, Feb. 5].

Prior to joining Apple in 1987, the 52-year-old Loren had been with Cigna Corp. for 16 years, where he held a number of executive appointments, including president and chief information officer of Cigna Systems, the company's information systems arm.

"Allan brings with him an impressive breadth of experience that includes general business, marketing and technical skills," said John C. Pope, chairman of Covia and executive vice president of marketing and finance at Covia's majority stockholder, United Airlines.

Covia, which is best known as the developer of the Apollo on-line travel reservations system, is jointly owned by several companies, including United (which holds a 50% stake), British Airways PLC, USAir, Inc., Swissair, KLM Royal Dutch Airlines, Alitalia and Air Canada.

Paul Blackney, who had been Covia's acting president and chief executive officer, will resume his previous duties as vice president of business development.

Judging By Other CASE Products, 80% Of Your Workload Doesn't Exist.

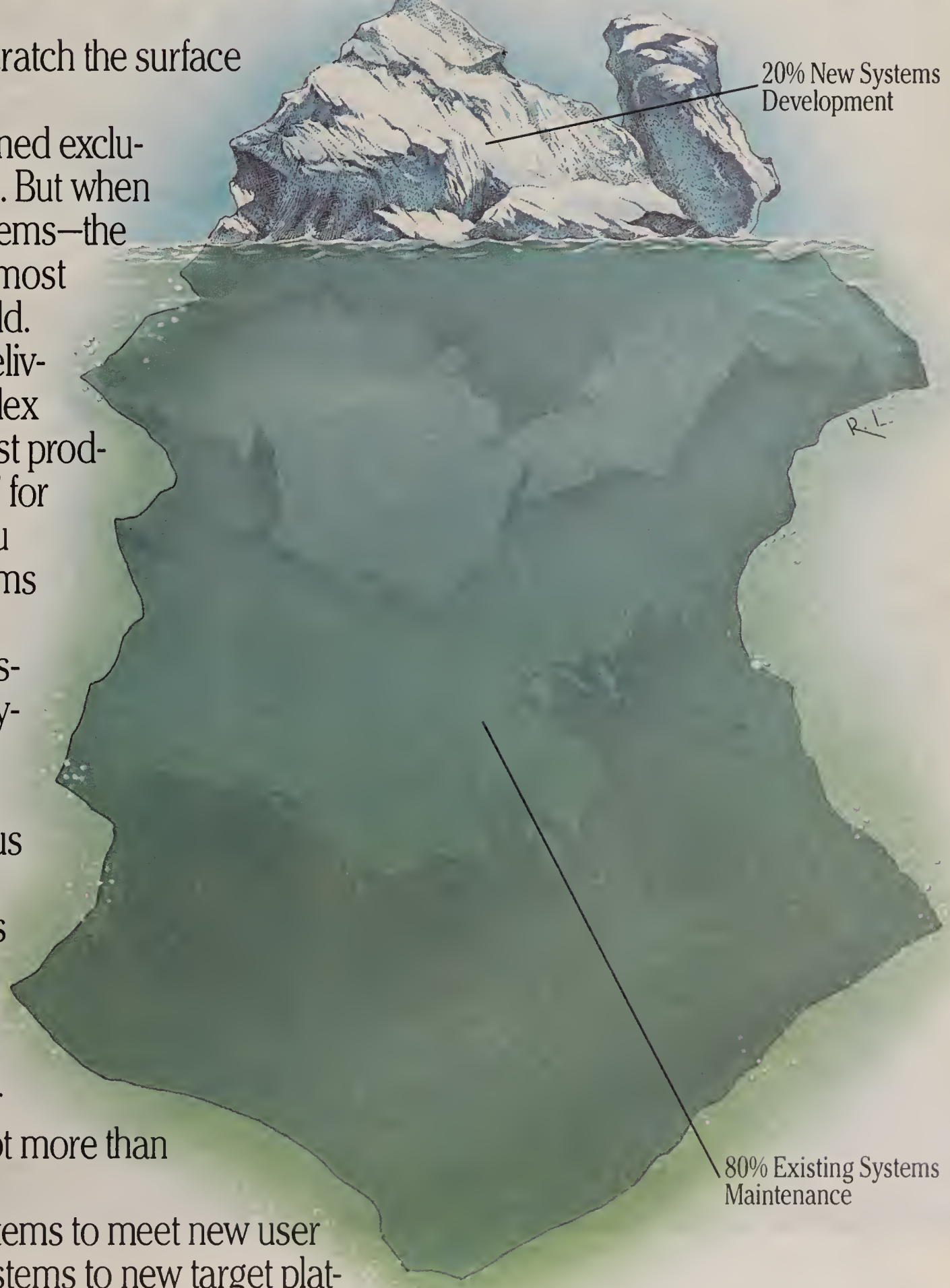
Most CASE products only scratch the surface of your development problems.

That's because they're designed exclusively for developing new systems. But when it comes to maintaining older systems—the biggest chunk of your workload—most CASE tools leave you out in the cold.

Fortunately, one company delivers a complete CASE solution: Index Technology Corporation. Our latest product offering, Excelerator® for Design Recovery, lets you bring your existing systems into the CASE environment.

This innovative product translates complex code into clear, easy-to-understand diagrams. It scans COBOL data and procedure divisions, IMS database definitions, plus IMS/MFS and CICS/BMS screen maps—and captures their underlying structures in a CASE repository.

With Design Recovery and the other powerful products in our Excelerator Series, you can do a lot more than just develop new systems.



You can also modify old systems to meet new user requirements, migrate existing systems to new target platforms, or even adapt old systems to support new business goals. All of which means you won't have to scuttle your current investments to keep pace with your changing needs.

For more about our complete CASE solution, call us today at 1-800-777-8858—before the biggest part of your workload takes you under.

Index Technology

There's No Substitute For Experience.

Excelerator is a registered trademark of Index Technology Corporation, One Main Street, Cambridge, MA 02142. IBM is a registered trademark of International Business Machines Corporation.

Keep your users

*Suggested U.S. list price. Adobe and PostScript are registered trademarks of Adobe Systems, Inc. in the U.S. and other countries. ©1990 Hewlett-Packard Company PE12023

Introducing the new HP LaserJet IIID printer. The LaserJet printer for handling the high-volume requirements of the multiuser environment.

There's a lot for everyone to like and use. Two paper trays that let users easily switch between different types and sizes of paper. With each tray holding 200 sheets. Which means less reloading. Two-sided printing that allows your users to print their thoughts and reports on both sides of a page. And, if your people would like to say good-bye to feeding envelopes manually, they can—it's done automatically by our optional envelope feeder accessory.

Thanks to the same Resolution Enhancement technology found in the LaserJet III, dot sizes actually vary. So curves really curve. Lines are never jagged. And you get resolution never before seen in a 300 dpi printer. Output has never looked so good.

Of course, all types of options are available for all types of users. They can customize with Adobe® PostScript® software. Add memory. Or better express themselves with our MasterType library of fonts and typefaces. Even connect a Macintosh.

What *you'll* like is the reliability and service you've come to expect from Hewlett-Packard. And that the LaserJet IIID is available for only $3,595.* So call **1-800-752-0900, Ext. 1592** for more information on the new HP LaserJet IIID.

HEWLETT PACKARD

ADVANCED TECHNOLOGY

TECH TALK

Robot brain surgeon

■ Brain surgeons at Johns Hopkins Hospital in Baltimore are experimenting with a computer-controlled robotic arm that allows them to make smaller and more precise incisions during brain surgery. The arm, which consists of a six-jointed mechanical sensor, works in sync with a computer that creates three-dimensional images of a patient's skull and brain. The surgeons make an incision in the patient's skull using the computer images as a guide. Once the brain is exposed, the robotic arm cuts to the brain surface and is used to define the tumor that is to be removed.

A look around

■ Scientists at Texas Instruments, Inc. have devised an autostereoscopic display called Omniview that projects color computer graphics in three-dimensional form inside a glass bubble. The prototype display, which is inside a 2-foot-diameter sphere, can be viewed from any angle without the need for special glasses. The images are created from a translucent double-helix disk spinning at 600 rpm while being scanned by a low-power laser in two dimensions. The display has a picture resolution of 750 by 750 pixels. The display could be used for air traffic control, military battle systems, modeling and several other applications.

Fractals in motion

■ Iterated Systems in Norcross, Ga., demonstrated a fractal image compression system that enables an Intel Corp. 80286-based personal computer to process full-motion video. As much as two minutes of full-motion video can be stored on a 1.4M-byte floppy disk, the firm said. The compression process is done using a reduced instruction set computing (RISC)-based processor board and custom fractal transform chips — both developed by Iterated — and an Intel 80890 RISC processor.

But can you read it like a book?

Cornell tries to make electronic database information as easy to use as a library

BY MICHAEL ALEXANDER
CW STAFF

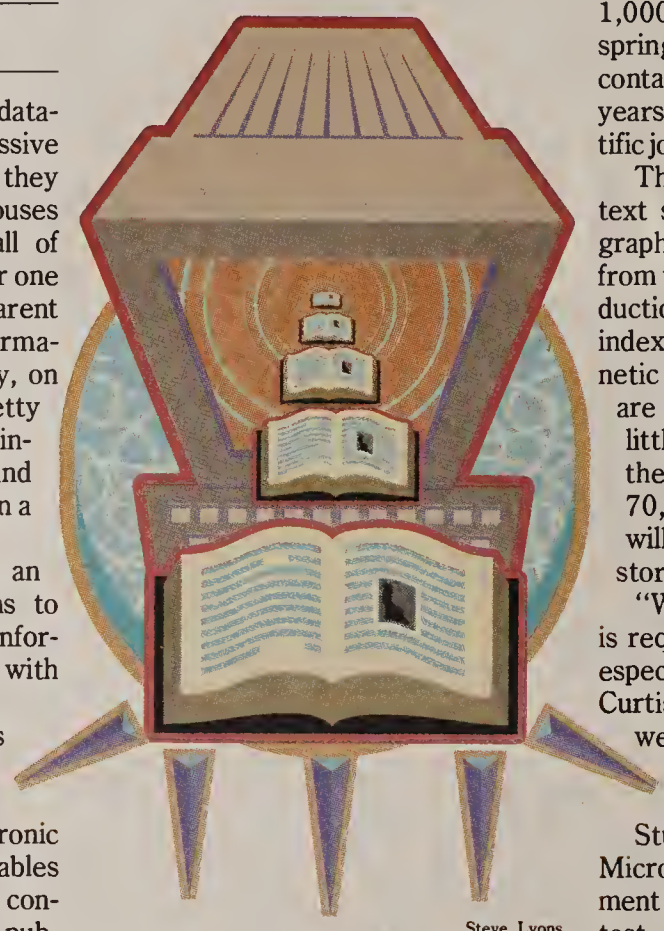
Even though electronic databases contain massive amounts of information, they are more like warehouses than libraries. While all of the information is contained under one "roof," it may not be readily apparent where and in what form the information is stored. Walk into a library, on the other hand, and you have a pretty good idea what aisle contains the information you are looking for, and you can expect it to be contained in a book.

That is the basic premise of an "electronic library," which aims to combine the massive amounts of information in an electronic database with the logic and facile use of a library.

About 150 chemistry students and faculty members at Cornell University in Ithaca, N.Y., are experimenting with such an electronic library, an on-line system that enables users to retrieve information contained in thousands of articles published by the *Journal of the American Chemical Society*. Unlike on-line databases, the electronic library is not limited to textual information: Users are also able to retrieve graphics, illustrations and other images.

It is the first test of its kind, according to officials at Cornell's Albert R. Mann Library, where the Chemistry On-Line Retrieval Experiment (CORE) is being conducted, and Bellcore, where the system's experimental Superbook software interface and database engine was developed.

"Chemists tend not to use or find on-line services that useful because the graphical components are key to understanding," said Howard Curtis,



Steve Lyons

head of the information technology section at the Mann Library. "Take away the schematics, photos, illustrations, and there's not much left."

One objective of CORE will be to determine whether on-line text and image retrieval and reading the material on screen is more practical than actually scouring the shelves for chemistry articles.

"It is not just a question of how willing researchers are to search and browse electronically but also whether they will want to read on their screens," Curtis said.

In the current test phase, which began three weeks ago, students and faculty can retrieve text and images from 1,000 articles. By the end of next spring, the database is scheduled to contain 70,000 articles, or about seven years' worth of articles from 20 scientific journals.

The database consists of four parts: text stored as ASCII files, an index, graphics that have been extracted from the articles and 300 dot/in. reproductions of complete pages. Text, the index and graphics are stored on magnetic media; the page reproductions are stored on optical discs. Although little of the information contained in the publications is in color, the 70,000 articles and related graphics will take up about 160G bytes of storage space.

"We need to figure out exactly what is required in the database structure, especially the storage of graphics," Curtis explained. "To what degree do we have to replicate the printed page and to what degree is the electronic journal a new entity?"

Students and faculty are using Sun Microsystems, Inc. and Digital Equipment Corp. workstations during the test. Eventually, other workstations and operating systems will be used.

Cornell plans to test three electronic library user interfaces: Superbook and Pixlook, developed at Bellcore, and Diadem, developed by OCLC. It's too early to determine what interface users will prefer, mainly because the initial testing has been limited to Bellcore's Superbook, Curtis said.

"We launched the Superbook project to try to make the screen presentation of text better than paper rather than worse," said Tom Landauer, manager of Bellcore's cognitive research division in Morristown, N.J. "We believe that Superbook is the first and only on-line hypertext application that makes it easier to use than harder."

Wyoming tests smart-card benefits program

BY MICHAEL ALEXANDER
CW STAFF

The Department of Health for the state of Wyoming is preparing to launch a nine-month pilot project using smart cards to help administer the state's Special Supplemental Food Program for Women, Infants and Children (WIC).

A number of states are experimenting with on-line electronic benefits programs, but this is the first that makes use of smart-card and off-line technology, said Peter Ognibene, vice president of corporate development at Applied Systems Institute, Inc. The Washington, D.C.-based company will design, install and administer the project, which will be officially launched in March.

The WIC program provides dietary counseling and vouchers for nutritionally rich foods to low-income pregnant women, nursing mothers and children under five years old. Six hundred participants in Natrona County will receive smart cards containing personal and benefits information that they can use to shop for WIC-authorized foods at four grocery stores in Casper and the rural community of Edgerton.

Wyoming opted to use a smart card system because installing on-line electronic benefits systems, especially in the state's sparsely populated "frontier counties," was simply too high, Ognibene said. It will cost $200,000 to implement the project.

Smart cards will replace paper vouchers, outline types of foods and track the amounts to which the benefits recipient is entitled. The card is plugged into a small point-of-sale terminal that notes the universal product code of each item, compares it with items listed in an electronic code book to ascertain that it is among the approved foods and deducts the amount from the smart card's database.

"One disadvantage of the voucher system is that you can't split the voucher," Ognibene said. "It's a must use it or lose it situation. We'll be giving [participants] the ability to shop as often they need to."

At the end of each business day, the transactions recorded by the terminal will be uploaded to an Intel Corp. 80386-based personal computer in Cheyenne. Later, the information will be used to trigger electronic funds transfers from the American National Bank of Cheyenne to the four participating grocers.

ENDEVOR.

The new school in software management.

Some of the biggest fishes in business have graduated. They've outgrown their manual software change procedures and library management systems and moved to ENDEVOR,® the new school in software management. For companies big or small, ENDEVOR helps eliminate the growing pains that come with an expanding software inventory by providing automated and integrated facilities for performing all software management tasks.

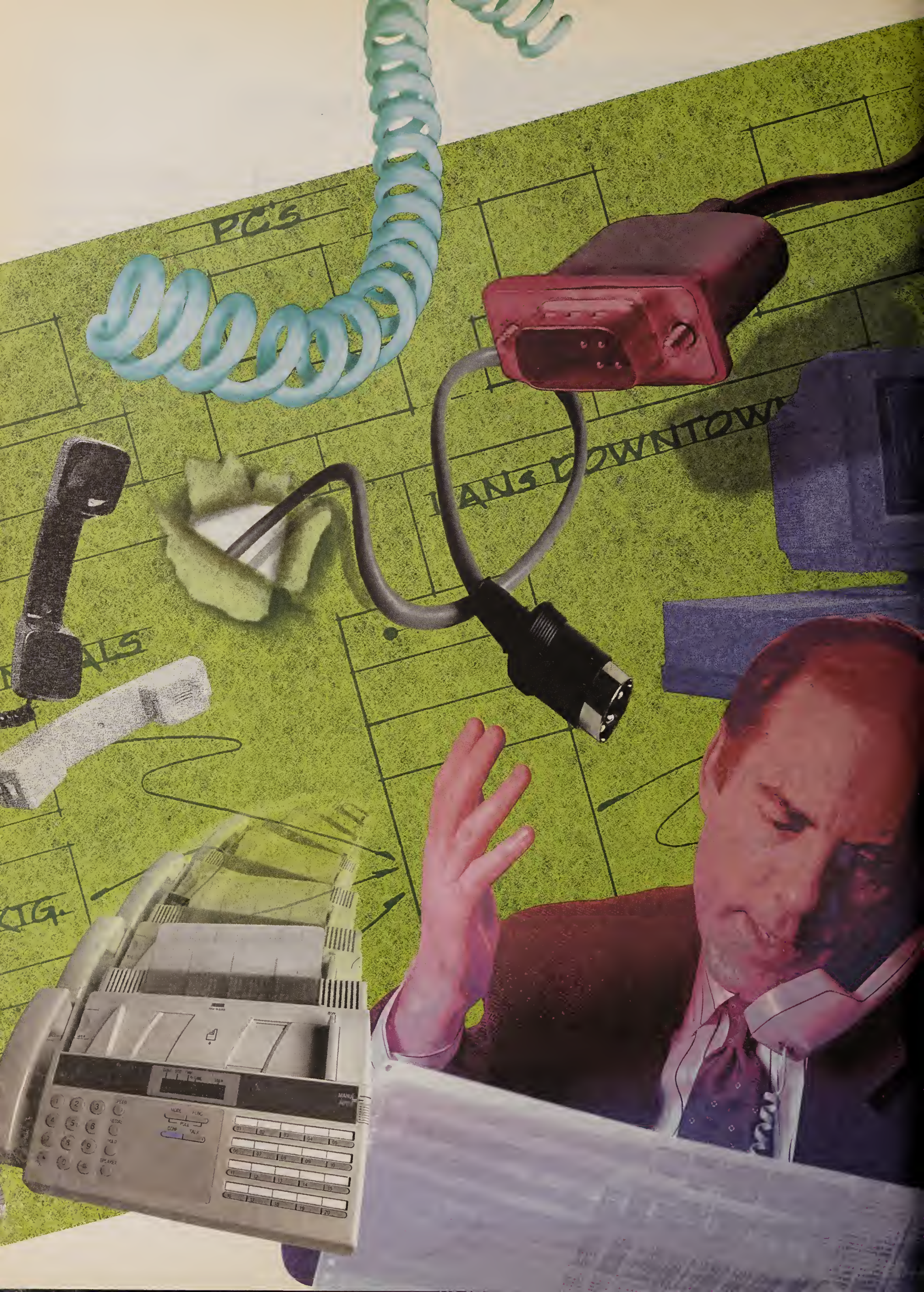
Automatically, ENDEVOR audits all change activity, tracks program-component configurations, and enforces standard software processes. It also automates the management of application vendor updates, production turnover, parallel development and software distribution.

ENDEVOR works with emerging technologies, such as CASE generators, LANs, DB2 and CSP, and through its open architecture, ensures full expansion into AD/Cycle—all without disrupting existing library management systems, procedures and structures.

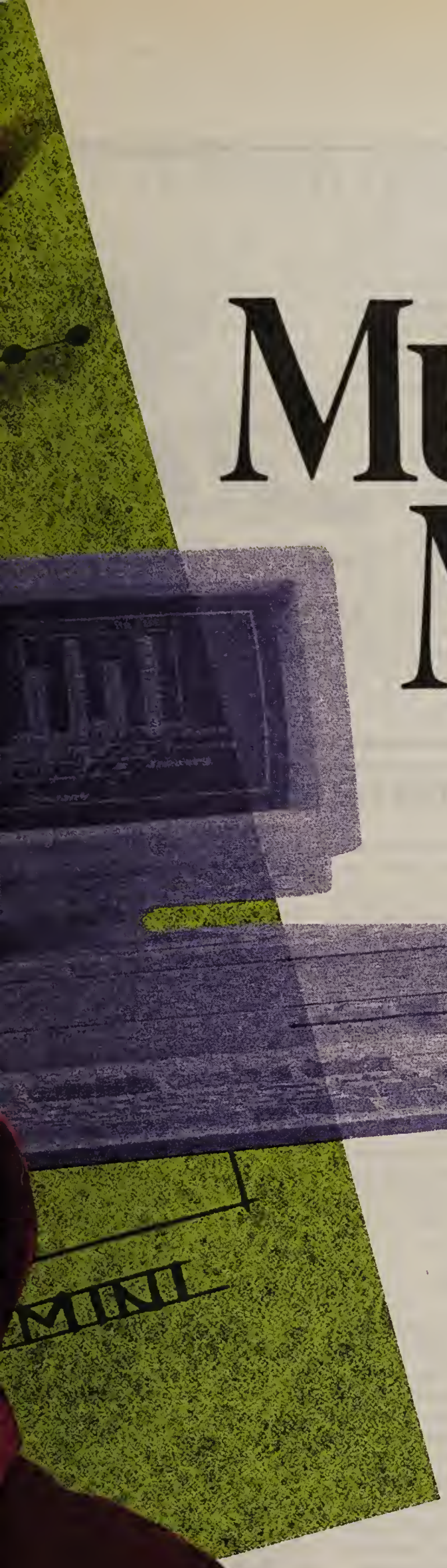
So keep your old school ties, but join the new school in software management. ENDEVOR. For more information, call LEGENT's Software Management Division at 508-870-1900.

© 1990 LEGENT Corporation. ENDEVOR is a registered trademark of LEGENT Corporation. DB2 and AD/Cycle are registered trademarks of International Business Machines Corporation.

LEGENT


PC's

© 1990 AT&T



Multi-Vendor Madness

Or, How To Tie Your Networks Together And Regain Your Sanity.

Does your state-of-the-art equipment from one vendor refuse to talk with your state-of-the-art equipment from other vendors? Then you've got a case of Multi-Vendor Madness. But it is curable. AT&T Network Systems has the remedy. The AT&T 5ESS® Switch and Bell Labs designed Metropolitan Area Networking can be used by your local phone company to interconnect your networks. This system can make your equipment from one vendor talk to your equipment from other vendors. No matter where that equipment is located. And it does it over the phone lines you already have installed. It's not snake oil. It's real medicine. Scientifically proven to work. With your local phone company and AT&T, you can make Multi-Vendor Madness a thing of the past.

Real-World Solutions From Your Local Phone Company and AT&T

AT&T
Network Systems

EDITORIAL

Ad lib

REMEMBER THAT VACATION advertisement a few years back that referred to a tropical paradise as "a state of mind?"

That same phrase can be applied to the debate over whether the U.S. economy is mired in a recession. The debate has spilled out of the economists' offices — where doctors of the dark science are assessing whether the GNP has actually declined the recession-requisite two quarters in a row — to the general media.

Conclusive data is not in. But that doesn't matter. If you look at the headlines in the newspapers, they are gradually shifting from the "yes we are in a recession/no we're not" tenor to one questioning how long the recession will last and how deep it will be.

In other words, as a nation, we are becoming firmly rooted in a recession state of mind, in the same way we accept cooler weather and shorter days as the onset of winter. Just as bleakly, too.

You don't have to get sophisticated to observe the recession state of mind in action. Two weeks ago (eight weeks prior to the post-Christmas sales), a major Boston retailer held a 30% off everything sale. Salespeople often outnumbered customers during the day. Check out the cabin seating of your next business flight. You'll find it much easier than in past months to locate three empty seats across to stretch out. And you can make dinner reservations for just about any time at your favorite restaurant.

For most people and for most sectors of the economy, this will be the first recession in nearly a decade. But for information systems, it will be the first since the big crunch brought on by the original oil crisis of 1974.

That is because the information sector and the computer industry continued to boom along during the 1981-82 recession while the rest of the economy hobbled. While interest rates and unemployment soared, programmers and systems analysts demanded and received double-digit raises, and high-paying data processing jobs went begging for talent to fill them.

This time, however, IS departments are catching the recessionary wave as well. With so many large corporations as well as the U.S. government burdened by heavy debt, senior management is sparing no departments in the effort to pare costs and boost short-term profit.

As attendees at a recent IS management conference were told, the most important task to complete in these times is to (privately) prepare a set of contingency plans that assume varying levels of departmental cuts, such as 10%, 20%, etc. Critical to this process is categorizing IS projects from mission-critical on down and then preparing to make cuts accordingly.

Who knows, if the situation in the Middle East were to be resolved expeditiously, the recession state of mind could disappear like a desert mirage, and all would be well with the economy again. But here and now, people are thinking more along the lines of another ad, the one for Calgon bath oil that beckons to "take me away."

LETTERS TO THE EDITOR

Doctor suits

Regarding your article "New federal database aims to snag problem doctors" [CW, Sept. 17], the article emphasized that access to the data would be strictly controlled. But there was no mention of how the data may be used by authorized organizations.

Medicine is a risky business, which cannot succeed every time. Thus, all medical practitioners have some small probability of being successfully sued. In a situation like this, simply saying that because a practitioner experiences more suits than the average *does not* imply that the doctor is incompetent.

As an example, take a group of 9,683 JUA-insured doctors. Between 1975 and 1983, these doctors had 2,131 malpractice cases. Assuming that all doctors are equally competent and, as a result, have the same probability of experiencing a suit, it can be statistically calculated that 80.25% of the doctors will have no suits, 17.66% of the doctors will have one suit, 1.94% of the doctors will have two suits, and .15% of the doctors will have three or more suits. We would observe that 3% of the doctors are responsible for 24.1% of the suits. It would be tempting to "reduce the likelihood that incompetent practitioners can avoid detection by moving from one state to another" by disciplining all doctors with more than a particular number of suits. Recall, however, that we started out by saying that all doctors had the same chance of a suit — they are equally competent.

Designers of such systems should be careful to provide the information needed to make good decisions.

In the case of malpractice suits and other rare events, the most that can be said is that there is some probability that the number of suits against a particular doctor is not due to chance. It is this probability that should be provided to the end user, not the number of suits. The possibility of litigation makes it especially important to be careful when providing decision-making information from databases such as this.

Trevor Nysetvold
Yale School of Organization and Management
New Haven, Conn.

Aye, Captain

Regarding "High hopes for home PC market" [CW, Oct. 29], I, an IS professional, do not want a PC at home. I want a system that does domestic tasks (checkbooks, food inventories), but I want it to work like an appliance, not a PC. I want my bank statements processed electronically. I want my bills managed via computer as well as my air conditioning, lights and security system.

The needs of a home computer are not just watered-down versions of commercial software. Computers in business help control the huge "paper shuffle" generated by people. That's not my problem at home. The problem with today's home computers is that they are not designed or programmed for the home environment.

A home computer should have the look and feel of household items, not a typewriter. I hate keyboards. Touch-sensitive and voice-recognition inputs are what I want. "Computer! Prepare a shopping list — and include items for a steak dinner for six for next Friday!" "Computer! Remind me to watch the Dolphins play the Jets next Saturday at 1:00 p.m." That is what a "home computer" is all about!

Count Darling IV
Vice President of Operations
Rally Accessories, Inc.
Miami, Fla.

C the errors

Having read your Product Spotlight article entitled "A programmer's view of C++" [CW, Oct. 22], I am reminded of those pictures wherein you were supposed to find all the mistakes. Here is a list:

1. Function prototypes are added by ANSI C. C++ is not needed for these.

2. Call-by-reference: C++ does *not* pass parameters by reference. A reference operator is added to allow more convenient pointer usage.

3. Class definitions are contained within curly braces, not square brackets. The example will not compile.

These inaccuracies, along with confusing sentences such as, "An in-line function is better than a C #define because . . .", make me worry about the level of truth and precision you bring to your readership.

Tony Holderith
Xerox Corp.
El Segundo, Calif.

Computerworld *welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor In Chief,* Computerworld, *P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail:* COMPUTERWORLD. *Please include a phone number for verification.*

IS: A tough road for minorities

VIVIAN G. WILSON

For blacks, the information processing industry has evolved greatly since the early 1960s, but there is still a long way to go. Computer careers appear to be anything but color-blind.

In the mid-1970s, there was considerable upward mobility for blacks in information systems. But this upward mobility has not kept pace with the increases in speed and power of the technology.

Until that first surge, blacks had been employed at the lower end of the information systems ladder. They were hired as computer operators, console operators, tape librarians, data entry and/or electronic data processing equipment operators. Somewhere along the way, perceptive managers realized that blacks were intelligent and decided that they could help fill a human resource void in the IS personnel arena.

Blacks who were at the right place at the right time were given opportunities to move up into the more specialized areas of IS. They became programmers, data entry supervisors and sales personnel as openings were made available on a limited basis. Only after affirmative action programs were put into place were many higher-level management positions opened to blacks.

In many cases, those managers were known as "tokens" — blacks who enabled companies to meet their quota of minority employees in management positions. This reputation remained even though the minorities had the experience and education to get the work done.

Blacks, of course, must give 110% capacity compared with their "majority" counterparts and often feel that whatever they do is simply never going to be enough.

The deficiency in the number of blacks in management positions persists. Rarely will you find a "majority" manager who will push the super-intelligent, business-minded black manager into a position to be promoted to a high-level position.

More frequently, the "majority" manager is insecure and intimidated by the black manager's abilities. He will step in and halt a black manager's climb up the career ladder. The reasons are numerous and too subjective to be discussed here. However, those blacks who have been fortunate enough to even be considered as managerial material have heard all of the excuses.

As head of the Black Data Processing Associates (BDPA), a national organization of blacks in IS, it is clear to me that many young minorities entering IS may be heading for a dead end.

BDPA believes strongly that one of the key needs in this area is for role models for blacks in IS.

It is rare in black households to find college-educated men or women trained in the sciences or technology. This must change in order for IS to become a more viable profession for blacks. Mentors are critical to give young blacks guidance in how to fashion rewarding careers in this field.

In my opinion, there is a list of things that must happen for blacks to find satisfaction and growth in IS:

- More mentors must be developed for blacks in the corporate structure.
- Black IS professionals must commit to continue a sense of giving 110% to accomplish the same as our "majority" counterparts.
- They must be determined to participate in certification and accreditation organizations, despite the perception that they are biased in their processes.
- Those on the way up must resolve not to let one door closing stop them from pushing another door open, even if it means starting their own businesses.
- Those blacks who have made it must remember to keep the doors open for those who follow them. They must network with other professionals, give back time and energy to youths following in their footsteps and share their business knowledge.

Wilson is the national president of the Black Data Processing Associates.

And now for the moral of our story . . .

MICHAEL COHN

Our director recently dragged us in at 7 a.m. for his annual motivational breakfast. Now I'm not all that cheerful at 7 a.m., and to make things worse, our speaker opened with a children's story about this irritating little engine that said "I think I can" every 15 seconds.

Perhaps it was because I'd heard that story 100 times before. Or perhaps it was because the woman beside me had spilled cocoa in my lap. I suddenly felt tremendously motivated . . . to nail the upbeat guy with the remainder of my lemon jelly doughnut. Unfortunately, I was all the way in back, and the pastry landed well short of the podium, grazing our tape librarian (who was sound asleep, anyway).

I feel pretty bad about the whole thing now. Those old stories aren't as childish as they seem. There are pearls of wisdom in the fables you heard as a kid. I've dragged up a few of my favorites . . . the ones that might still apply to information systems today.

The Ant and the Grasshopper. There once was an ant and a grasshopper who were best of friends. The ant was prudent and industrious and one day decided to build himself a warm winter home. The grasshopper, however, was not concerned about the future and spent most of his time on the couch watching the *Home Shopping Network*.

It soon began to grow cold. The ant, who had been planning, designing and building his home for months, was all nice and cozy. Meanwhile, his long-legged friend had done nothing about the rough times ahead. But just when it looked like curtains for the grasshopper, he marched over to the ant's house, reverse-engineered the whole thing and built his own version in 20 minutes.

The ant thought this was terribly unfair but was so much smaller than the grasshopper, he really couldn't do anything about it. So the ant just sat and pouted, while the grasshopper went inside and watched *The Simpsons*.

Moral: It's good to be first. But it's better to be bigger.

The Careful Squirrel. One morning, a squirrel came upon an abandoned nest high up in a tree. "What a perfect place to store my food," thought the lucky squirrel. "But can this tiny nest support the weight of all my acorns?"

The squirrel wisely decided to test this acorn repository. He put large rocks in the nest. He even climbed into the nest and jumped up and down. Still, the nest proved acorn-worthy. Exhausted but satisfied, the squirrel gathered his stash and loaded the nest. But as he placed that last acorn atop the pile, he noticed something was wrong. The branch beneath him quivered, then gave way . . . and the squirrel, the nest and the acorns all fell to the ground.

Moral: No matter how much you test, it just takes one nut to screw things up.

The Three Little Pigs. Once upon a time there were three little pigs, who received an RFP from the Big Bad Wolf. But the pigs could not agree on what system to propose, so they split up, each trying to win the contract for himself.

The first little pig's system was dirt cheap; he cut corners on the chip technology. He called his system "Straw-286" and demonstrated it for the Big Bad Wolf. However, when the wolf loaded his data, it blew away Straw-286, and the first little pig was mortified.

The second little pig proposed speedy "Sticks-386," which cost a little more but was worth it. But when Sticks-386 tried to handle the wolf's connectivity requirements, it huffed, and it puffed, and it fell apart. The second little pig filed for Chapter 11.

But the third little pig was smarter and more patient. After several months, he came up with "Bricks-486," which was a high-priced, yet leading-edge solution. He proudly called the Big Bad Wolf to schedule his demo. When he did, the secretary informed him that Mr. Wolf had cash flow problems and had to settle for "Straw-286" for now but would consider upgrading in three or four years.

Moral: What it costs is more important than what it does.

Mr. Rabbit's Garden. Mr. Rabbit was tired of foraging for food. One day he decided, "Why not plant a garden? I'll grow all I need, with enough left over to make my killer gazpacho."

Mr. Rabbit sat down and carefully planned his garden. He did a needs analysis of sun and shade. He constructed a resource list of seed and tools. He built a harvest Gantt Chart. He outsourced his fertilizer requirements to the horse up the road.

After days of prepping his garden project, he selected a shady spot under a big oak tree. He planted according to his Soil Timing Study and managed his critical tasks so that, by early autumn, he had a bountiful garden.

On the scheduled morning, Mr. Rabbit put on his overalls and went to the oak tree to harvest his garden. He stood there for a moment, admiring the ripe tomatoes, abundant carrots and crisp cucumbers. But just as he bent down to pluck his first pea, he heard a horrible racket . . . and Mr. Rabbit looked up just in time to see this squirrel, nest and swarm of acorns fall from the sky and wreck his whole garden.

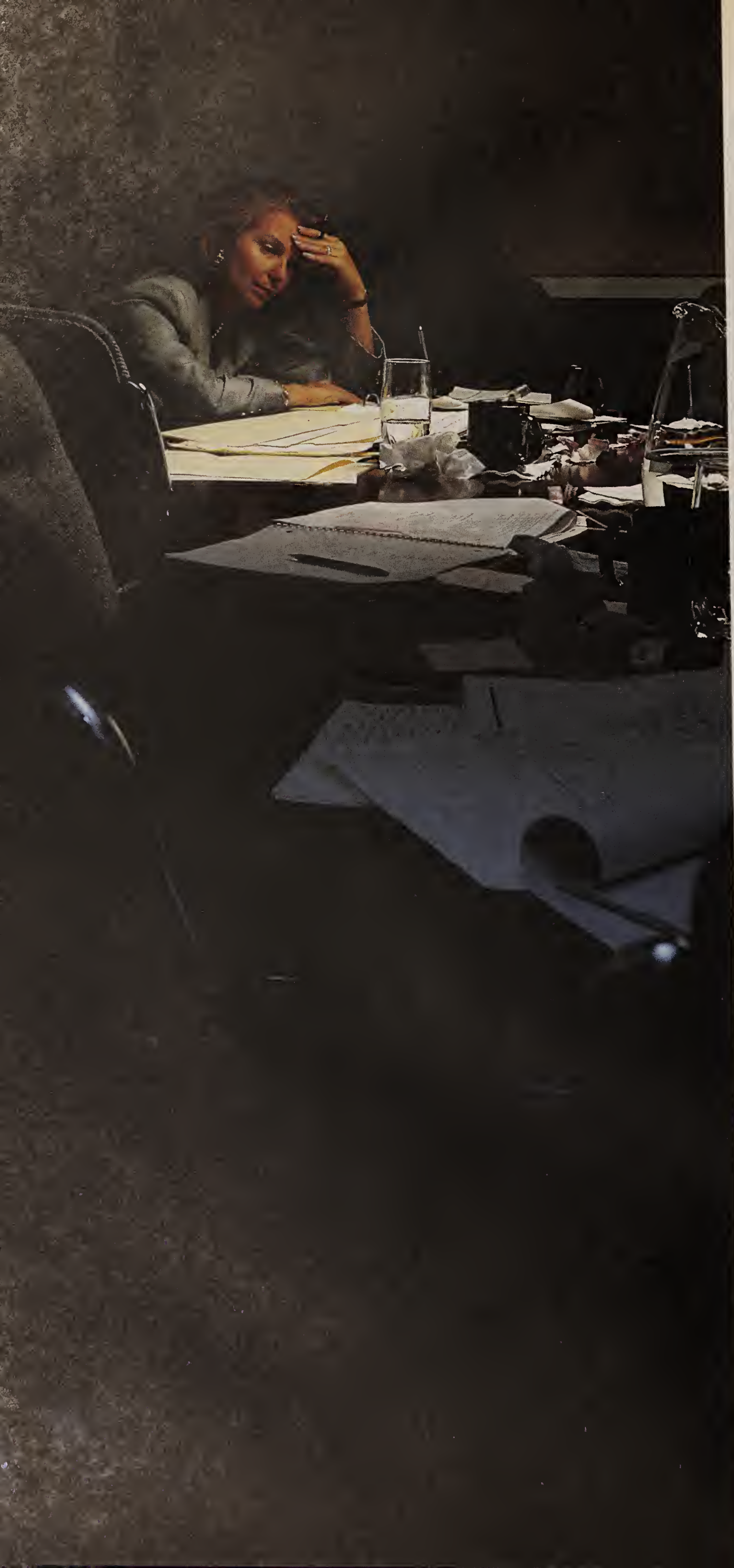
Moral: Even the best managed project can get screwed up by someone else's nuts.

The Racing Roosters. A hen was hopelessly attracted to two roosters and was having quite a time choosing between them. The pair decided to have a race, with the loser agreeing to fly the coop. As the love-struck hen breathlessly watched, her suitors lined up at the edge of a field, then off they went . . . each determined to be the faster fowl.

For a few seconds they ran neck and neck. But one rooster was quite a bit younger and quickly began to pull ahead. It soon was evident that the young rooster ran much faster . . . so fast, in fact, that he ran right onto a southbound lane of I-95 and was flattened by a Ford Taurus with Missouri plates.

Moral: Winning the benchmark is one thing; winning the contract is another.

Cohn is trying to be a computer salesman in Atlanta.



Datacente
Software r
The IS bu

© 1990 LEGENT. All rights reserved.
LEGENT is registered in U.S. Patent and Trademark Office.

headcount out of control.
aintenance costs are rising.
get just got slashed.

There's never been a better time to be an IS executive.

It's the typical IS dilemma. Improve service. Increase productivity. Reduce costs. Today, LEGENT Corporation is supplying the technologies and strategies that successfully support the "do-more-with-less" objectives of IS Management.

With LEGENT technologies, many IS managers are quantifying and assessing their entire environment. Then they further exploit LEGENT solutions to automate and improve datacenter performance, enhance system and network productivity, and automate and manage the application development life cycle. Resulting in increased productivity, improved user service levels, and a reduction of overall IS costs.

IS Management. Performance Management. Operations Management. Software Management. And Network Productivity. Five technologies from one company committed to building an effective partnership to ensure the success of the IS enterprise.

For more information, call LEGENT at 1-800-326-1992.

LEGENT

CSX Transportation uses BMC Software products for the long haul.

CSX Transportation, one of IBM's largest North American customers, believes that licensing BMC's IMS, CICS and DB2 products makes good business sense now and in the future.

The fast track

Kerry Tenberg, DB2 Technical Specialist says, "BMC consistently offers quality products that significantly increase our productivity. BMC also provides responsible and knowledgeable support representatives. The support is terrific."

According to Tenberg, BMC's outstanding track record at CSX with IMS and CICS, as well as DB2, is why new BMC products are evaluated; function, performance and quality are why BMC products are brought on board.

The long haul

"To help us stay on the leading edge of technology, BMC provides continuous product growth and evolution. For instance, we've been extremely pleased with how fast BMC's DB2 products exploit new DB2 capabilities. Our participation in BMC product development focus groups has convinced us that BMC's commitment to future development will continue," says Tenberg.

Get on track with the leader

Find out how BMC Software can offer you a single vendor solution to get you on track and keep you on schedule. For more information on BMC's IMS, CICS and DB2 products call

1 800 841-2031

or FAX your request to:
713 242-6523.

BMC SOFTWARE

Internationally, contact one of BMC's wholly owned subsidiary offices in:

Australia	Denmark	England	France	Germany	Italy	Japan	Spain
(61)3 819 6733	(45)44 68 22 00	(44)276 24622	(33) 1 48 77 77 77	(49) 69 664060	(39) 2 48193850	(81) 3 837-8651	(34) 1 639 30 62
FAX:(61) 3 819 6758	FAX:(45) 44 68 33 00	FAX:(44)276 61201	FAX:(33) 1 48 77 01 17	FAX:(49) 69 6661047	FAX:(39) 2 48193846	FAX:(81)3 837-8585	FAX:(34) 1 639 42 75

IBM Business Partner

IBM is a registered trademark of International Business Machines Corp.
DB2 is a trademark of IBM Corp.
© 1990 BMC Software, Inc. All rights reserved.

COMMENTARY

Rosemary Hamilton

An OOP object lesson

Object-oriented technology sure is a hot topic. Several information systems managers contacted recently said they are investigating it.

Meanwhile, you would be hard-pressed to find a vendor that does not promote it or endorse it. What's more, there's already debate in the market. On the programming side, some folks suggest that "pure" object-oriented programming (OOP) is superior to a hybrid language that is a mix of conventional and OOP methods. A similar split exists on the database side, with many vendors saying they will build object-oriented attributes into existing relational DBMSs, while other vendors are selling new object-oriented DBMSs as the next and better generation.

It can give you a headache, huh? For some IS managers, object-oriented technology must seem like just one more item they need to figure out. It must make them weary.

Before getting caught up in vendor promotions or market debates, however, a look to a user site such as the Brooklyn Union Gas Co. could be helpful. The company got started on an object-oriented project a few years ago, before there was all sorts of noise in the market about this technology. As a result, it didn't get tugged in different directions, and today it is running a customer information system based on object-oriented techniques.

It is important to note that Brooklyn Gas plans to sell this software to other utilities, so it has an interest in promoting its OOP success story. Still, the company's user experience with the technology might prove helpful to some IS managers.

Brooklyn Gas was drawn to OOP for the same reasons that many other IS managers may now be checking it out. It holds a promise of more efficient programming and maintenance. But OOP methods, not any particular product, became the focus of the Brooklyn Gas project.

The company didn't set out in search of OOP, said William

Continued on page 33

Bull users weathered by storms

After millions invested in sales and support, reviews remain mixed

ANALYSIS

BY SALLY CUSACK
CW STAFF

BILLERICA, Mass. — Since its acquisition by Groupe Bull in 1988, Bull HN Information Systems, Inc., the stateside operations for the international company, has been struggling with massive reorganizations, sweeping employee cutbacks and restructured product lines. Bull customers, having weathered the hurricane, have not necessarily emerged unscathed.

According to Steve Gardner, Bull HN's vice president of U.S. marketing, the company conducted an internal satisfaction survey with its customers in 1988, after the acquisition, and received a "dismal" response.

It was evident that the company's sales and support needed an overhaul, particularly in the small systems arena, Gardner said. "Frankly," he admitted, "we were getting sloppy."

Since then, Bull HN has invested millions of dollars in retraining its sales force, but the company is still playing to mixed reviews.

Groupe Bull announced earlier this month it will be cutting its U.S. employee payroll by almost 2,000, but according to a Bull HN spokesman, the layoffs will "absolutely not" affect customer service. "The purpose of the restructuring is to more closely align our organization with our customer's needs," he said.

Customers would certainly welcome further improvements. "The sales force has been spread too thin in the past," said Lou Rinaldi, operations supervisor at the Connecticut Department of Public Safety. "When we have inquired about certain products — things as simple as laser printer fonts — we would call a number of times and receive no response."

Rinaldi said the low point in customer service came in the summer of 1989, when the department was upgrading from a DPS 6 to a DPS 6 Plus computer, and the sales manager, who has since been replaced, was not conducting the proper follow-throughs with reference to system specifications and installation procedures.

Unfortunately, according to Gardner, servicing small systems provides the potential pitfall of establishing uneven performance patterns. "The demographics and service must be constantly evaluated," he said.

Rinaldi noted that Bull HN has recently supplied him with two new local sales representatives, one each for hardware and software, and he said he thinks that this may be an indication that the vendor is upgrading its service.

"Seeing will be believing," he added.

Commenting on Bull HN's approach to customer sales and service, William C. McCusker, director of the computer center at Citrus College in Glendora, Calif., observed that "it really is a mixed bag out there. Quality seems to depend on the site itself, its location and individual requirements."

McCusker, former president of the now defunct Honeywell Large Systems User Association, also pointed out that some areas of the country have actually seen increased sales and service support in the past six months.

For the most part, managers at Bull HN mainframe sites said they have traditionally benefited from strong sales and service support, and most seem to have never experienced any major problems with the vendor. However, there are still a few areas that the company must satisfy.

"It takes too long to get things done," said one IS director at a large Midwest manufacturing company that has a Bull mainframe and several Bull minicomputers for maintaining operations. "Sales reps are usually out of town or in meetings. I've complained several times over the past six or seven years."

Gardner promised that these last organizational wrinkles will be ironed out soon. He indicated that in 1990, sales training expenses alone have exceeded $2 million. "We have hired a number of new salespeople and have also invested heavily in leadership training and established management programs on a nationwide basis."

"They seem to be in a constant state of reorganization," said Dale Good, director of IS at the Minnesota Supreme Court.

The court has seven Bull DPS 7000 computers installed and is currently in the process of phasing out several DPS 6 minicomputers. Good says that, prior to the 1988 merger, a customer really "had to climb the ranks" to bridge the sales and marketing divisions of Bull.

McCusker noted that the vendor is grappling with much the same problems besetting other large companies that are trying to change the product and distribution channels.

Stating that Bull HN's new approach to sales and service is supported internally from "top management on down," Gardner said that the company is refocusing its sales force toward "solution" sales.

"We have to break away from the traditional iron mentality," he concluded, adding that results from the company's 1989 satisfaction survey yielded a "dramatic" improvement over the previous year's response.

Flatlands

Growth has been a rare commodity in Bull HN's market share during recent years

Percent of worldwide market by value of shipments	1986		1987		1988		1989	
	($M)	Mkt. %	($M)	Mkt. %	($M)	Mkt. %	($M)	Mkt. %
Large-scale systems	410	1.9	410	1.7	390	1.4	380	1.3
WORLDWIDE TOTAL	22.028		24.668		28.238		28.998	
Medium-scale systems	400	2.0	400	1.8	430	1.8	410	1.7
WORLDWIDE TOTAL	19.938		22.06		23.698		24.308	
Small-scale systems	270	1.5	280	1.3	250	1.1	280	1.2
WORLDWIDE TOTAL	18.358		21.188		22.988		23.31	

Source: International Data Corp. CW Chart: Doreen St. John

Oracle expands CASE tools repertoire

BY JEAN S. BOZMAN
CW STAFF

REDWOOD CITY, Calif. — Oracle Systems Corp. has ported a series of computer-aided software engineering (CASE) tools, originally announced last spring, to the OS/2, MS-DOS, VAX/VMS and Unix operating systems. The CASE tools include a CASE data dictionary, a graphical workbench called Case*Designer and a fourth-generation language called Case*Generator for Oracle's SQL*Forms.

As first announced, the tools were available only for the Sun Microsystems, Inc. Scalable Processor Architecture machine, which Oracle developers used to design the CASE software packages. "We brought the versions on all these platforms to the same level," said M. R. Rangaswami, director of Oracle's CASE marketing in the U.S.

The Case*Dictionary product is actually more than five years old but has been enhanced, said Richard Barker, senior vice president in charge of Oracle's CASE products. The graphically oriented Case*Designer tool, which allows developers to draw entity-relationship diagrams and data flow charts, was announced last spring.

"The data dictionary and the Case*Designer aren't entirely new," said Paul Winsberg, a principal at San Jose, Calif.-based Database Associates, who is evaluating the software. "The Case*Generator is new, though. It gives them a lower CASE capability that fills out their product line, although it has a ways to go compared with more mature products like Texas Instruments, Inc.'s IEF [CASE tools]." Upper CASE tools are meant for planning and analysis, while lower CASE tools are intended for code generation, he explained.

Winsberg said Oracle's set of CASE tools appeared to be not as tightly integrated as TI's Information Engineering Facility tool set. He added that they would only generate Oracle-based applications, although those applications could be made to run on different hardware platforms.

Oracle began shipping the CASE tool set for multiple software systems early this month, although the Sun version had been shipping for months. Among the Unix platforms now supported are Sun 4 workstations, several Hewlett-Packard Co. 9000 machines, Sequent Systems, Inc. computers, Data General Corp. Aviion workstations and Amdahl Corp. mainframes that run the UTS Unix operating system.

Pricing ranges from $13,000 for a single OS/2 copy to $100,000 for a large-scale VAX machine, according to Rangaswami.

The IEF™ can help you devel unprecedented quality, prod

"The IEF is a superior tool for implementing Information Engineering because it integrates the entire process from planning through code generation. We're deploying the IEF throughout the corporation."

David V. Evans
Vice President
Director, Information Systems
J.C. Penney

"Our On-line Banking system has been in production for more than 12 months—500,000 transactions a day—without a single code failure. And we had very few enchancements to do. Our users got what they needed the first time out."

Mark Quinlan
Senior Programmer/Analyst
Huntington National Bank

"To meet the dramatically reduced time-to-market requirements for our products, we need high-quality systems that can be changed fast. That's why we've chosen the IEF as the CASE solution for our entire organization."

John Pajak
Executive Vice President
Mass Mutual Life Insurance

"The strengths of the IEF are clear-cut. One obvious quality advantage is that application changes are made to diagrams, not code. This ensures ongoing integrity —the specification always matches the executing system."

Paul R. Hessinger
Chief Technology Officer
Computer Task Group

"I've seen other CASE tools fail, so I raised the bar high when we evaluated the IEF. It passed with flying colors. I could not be happier with my decision to adopt the IEF company-wide."

John F. Mott
President
AMR Travel Services

"Our users were extremely pleased when we finished our first project—a 60-transaction system—in one-half the budgeted time. We had tried interfaced CASE tools without success. IEF integration makes the difference."

Giorgio Sorani
Division Head – MIS
Lubrizol

"We are using the IEF to develop a new generation of manufacturing systems replacing over 300 existing systems. We estimate that IEF will increase our productivity by between 2-to-1 and 3-to-1 for new systems development.."

Wal Budzynski
Head of Operations, Systems/Computing
Rolls-Royce

"We used the IEF to rebuild our aging Frequent Flight Bonus system. With DB2 tables of up to 52 million rows, we needed high performance. And we got it...98% of our transactions complete in less than 3 seconds."

Cloene Goldsborough
Director of Data Resource Management
TWA

"Our first IEF system was completed faster, and with fewer errors, than any system I've ever seen. If I had to go back to the old ways, I'd find another job...outside the DP world. It means that much to me."

Mogens Sorensen
Chief Consultant
Nykredit (Denmark)

op information systems with uctivity and maintainability.

The success of Texas Instruments CASE product is proven—in the field.

Major companies have used TI's CASE product, the Information Engineering Facility™ (IEF™), for everything from rebuilding aging high-maintenance-cost systems to development of new enterprise-wide strategic systems.

Study shows zero code defects.

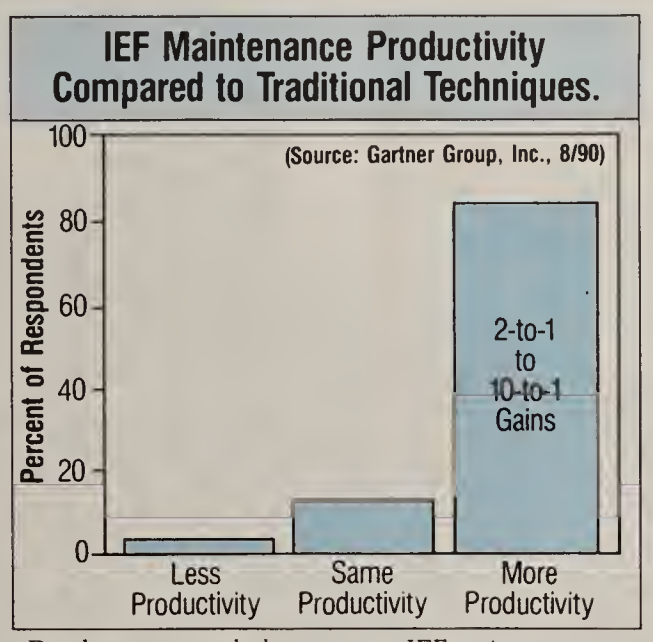
The quality of IEF-developed systems is remarkable. In recent CASE research by The Gartner Group, application developers were asked to report the number of abends they had experienced. (An "abend" is a system failure or "lock-up" caused by code defects.) *IEF developers reported zero defects—not one abend had occurred in IEF-generated code.*

Maintenance productivity gains of up to 10-to-1.

In this same study, developers were asked to compare IEF maintenance productivity with their former methods. Of those responding, *more than 80 percent had experienced gains of from 2-to-1 to 10-to-1.* (See chart.)

Specifications always match the executing application.

With the IEF, application changes are made to diagrams, not code. So, for the life of your system, specifications will always match the executing application. The Gartner Group research showed that *all* IEF users who reported making application changes made *all* changes at the diagram level.



Developers were asked to compare IEF maintenance to former methods. Of those responding, more than 80% reported productivity gains of from 2-to-1 to 10-to-1.

Mainframe applications can be developed and tested on a PC.

With our new OS/2 toolset, you can develop mainframe applications, from analysis through automatic code generation, on your PC. Then, using the IEF's TP monitor simulator and the diagram-level testing feature, you can also test these mainframe applications without ever leaving the PC.

More environmental independence coming soon—develop on PC, generate for DEC/VMS, TANDEM, UNIX.

The IEF has generated applications for IBM mainframe environments (MVS/DB2 under TSO, IMS/DC, and CICS) since early 1988. Soon you'll be able to develop systems in OS/2 and then automatically generate for other platforms. DEC/VMS, TANDEM and UNIX are scheduled for availability in 1991. More will follow. We are committed to increased environmental independence in support of the Open Systems concept.

We are committed to standards.

IEF tools and IEF-generated code will comply with standards as they emerge. We will adhere to CUA standards and to the principles of IBM's AD/Cycle and DEC's Cohesion—and we will support Open Systems environments centering around UNIX. In any environment, the COBOL, C and SQL we generate adhere closely to ANSI standards. Our presence on standards committees helps us keep abreast of ANSI and ISO developments affecting the CASE world.

Full-service support.

Of course, our technical support, consultancy, training courses, satellite seminars, and other informational assistance will continue apace. We also offer re-engineering and template services. This full-service support will remain an integral part of the IEF product.

For more information, including a VHS video demo, call 800-527-3500 or 214-575-4404.
Or write Texas Instruments, 6550 Chase Oaks Blvd., Plano, Texas 75023.

TEXAS INSTRUMENTS

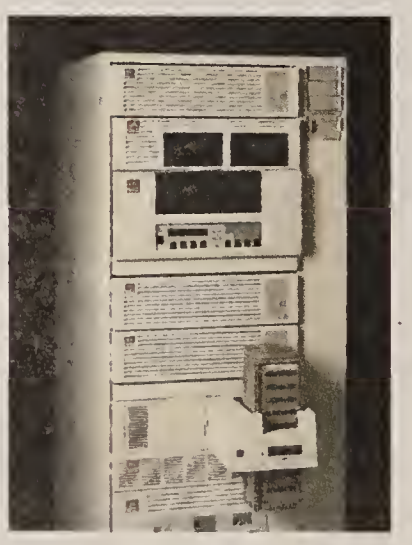
© 1990 TI
Information Engineering Facility and IEF are trademarks of Texas Instruments. Other product names listed are the trademarks of the companies indicated

66106

We're elevating IBM storage to new heights.

It's a known fact that the right storage solution is critical to your IBM system. Which is why, when you're building for productivity, you should look up to IPL.

Now the question is obvious: Why go with an IPL storage system when you have an IBM computer?



The Answer: No one, repeat, no one offers better IBM storage solutions than IPL. Not even IBM.

The fact is, IPL has worked exclusively on IBM mid-range storage and mainframe systems for the past 17 years. We lead in technological advancements that address your specific needs and applications. Plus, with maintenance and technical support available 24 hours a day, seven days a week, you can rely on rapid response.

From on-line disk storage, to off-line tape back-up and memory, IPL is to storage technology what IBM is to computers: The best. And the most advanced. Call IPL today at 1 800 338-8475 (617 890-6620 in MA). Because a storage system from IPL holds more than information. It holds your business.

ipl SYSTEMS INC.

IPL U.S. Headquarters: 60 Hickory Drive, Waltham, MA 02154 1 800 338-8475, ext. 2135 (617 890-6620 in MA) FAX: (617) 890-8128
IPL International: Impenastraat 10, 1930 Zaventem, Brussels, Belgium 011-32-2-725.41.58 FAX: 011-32-2-725.40.29

IBM and AS/400 are registered trademarks of International Business Machines Corporation.

Banks taking on Unisys image

BY ELLIS BOOKER
CW STAFF

BLUE BELL, Pa. — Unisys Corp. is starting to see a payback from its 1-year-old imaging system for banks, signing up the sixth customer for its Infoimage Item Processing System (IIPS) last week.

The $15 million sale to Barnett Banks, Inc., the largest commercial bank in the state of Florida, is the latest successful effort by Unisys to leverage its role as a provider of bank item processing systems and get its foot in the door before IBM's image-enabled item processing product hits the streets.

The dilemma for banks that are IBM check processing shops today but want an imaging component immediately "is the necessity to convert from IBM's check processing to [item processing system] first, before going to IIPS," said Stanley E. "Ned" Miltko, a senior vice president and head of image consulting at Littlewood, Shain & Co. in Exton, Pa.

Miltko said IBM, the leading provider of high-speed check processing to commerical financial institutions, has been delivering hardware for its bank imaging system, but software is still under development and will not be ready until next year.

The Chase Manhattan Bank N.A. in New York is trying to convert from IBM to Unisys's item processing approach to get the latter's imaging system, Miltko said.

In addition to Chase, other IIPS banking customers include Huntington Bancshares in Columbus, Ohio, The Northern Trust Co. in Chicago and Commercial Bank in Detroit. The most recent sale was late last month to Signet Bank, the second largest commercial bank in Virginia, which purchased a $7.5 million Unisys system.

Unisys claimed more than 200 customers for its IPS, which was first offered in the late 1960s. Both IPS and the image-enabled IIPS use the Unisys V series mainframe platform.

In addition, the balance recently tipped in Unisys' favor among Federal Reserve System institutions, which had split their traditional check processing business more or less equally between Unisys and IBM. Unisys now enjoys business from 26 of the 47 Federal Reserve check processing sites — most recently adding the Federal Reserve Bank of Philadelphia under a $6 million contract. Eventually, these could be significant imaging customers, Unisys sources said.

"The Fed's imaging strategy is to try and facilitate a merger between IBM and Unisys [technology]," said Thornton May, director of imaging research at the Nolan Norton Institute, a research branch of information systems consultancy Nolan, Norton & Co. in Lexington, Mass. The Federal Reserve already has a pilot with IBM's system under way, said May, who suspects Unisys is being tested as well.

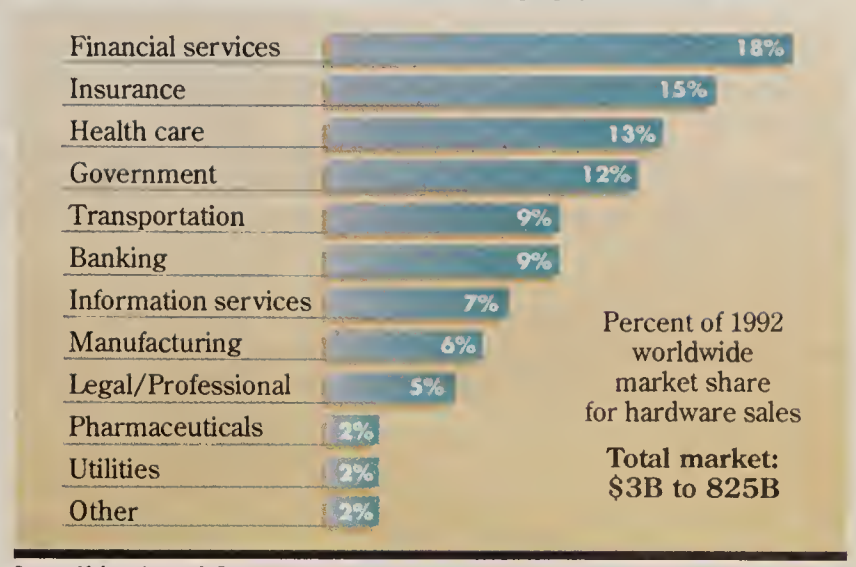
While it rushes to fill the market before IBM arrives, Unisys has to deal with a lingering legal dispute over its rights to the high-speed imaging technology. In May, TRW Financial Systems filed suit, alleging willful infringement of its patent. Unisys formally denied the charge in July and last month said it was confident it would prevail in the litigation. Unisys maintained that its own technology represents a substantial advance over what is contained in TRW's 10-year-old patent.

IIPS was announced in October 1989 along with Infoimage Engineering Document Management System for technical documents; Unisys launched Infoimage Folder, a general-purpose imaging system for office environments, in April.

Barnett, a $31 billion bank holding company based in Jacksonville, Fla., and the nation's 20th largest commercial bank, will use IIPS on the more than three million checks it processes daily.

Money market

It's the financial sector — insurance, banking and financial services — that will combine to buy more than 40% of the imaging systems sold in 1992



Source: Nolan, Norton & Co. CW Chart: Doreen St. John

Intelsat takes quantum leap to OS/2

BY MARYFRAN JOHNSON
CW STAFF

WASHINGTON, D.C. — From its front-row seat on modern world history, the International Telecommunications Satellite Organization has become accustomed to the kindness of technology.

Since Intelsat's 1964 launch of Early Bird, the first communications satellite, to its present flock of 15 geosynchronous satellites orbiting 22,000 miles above the earth, the organization has played host to worldwide broadcasts of everything from the first lunar launch to the collapse of the Berlin Wall.

Yet the overwhelming complexity of scheduling access to the world's most advanced communications satellites is driving Intelsat's operations center to shift away from its aging IBM 4381 mainframes toward a classic example of client/server distributed processing on IBM Personal System/2 workstations, running the latest release of the OS/2 operating system.

"This will give our operations people a quantum leap in flexibility over the current mainframe-based environment," said Gordon MacLean, manager of the operations planning department. "At the same time, one of the staff is trying to update the frequency plan for a satellite, another member may be working on a different aspect and extrapolating data to do other things."

Fueling the drive to a distributed system are two major applications now in the testing phase by Intelsat's MIS department, with consulting help from Logica Data Architects in Waltham, Mass., and General Electric Co.

The Operational Planning System (OPS) and Operations Frequency Planning System (OFPS) applications both address the complex planning process behind distribution of service throughout the global satellite network. Both will use information pulled out of the server database through OS/2 Presentation Manager at the workstations, and both will be written in the portable C language.

The Intelstat 7 *spacecraft will be launched in 1992*

As the core pieces of OPS go on-line in early 1991, they will be used to configure the network and allocate predicted traffic to satellites. The front end of the application will be an expert system — Art/IM from Inference Corp. in El Segundo, Calif. — which simplifies and automates routine changes in satellite configurations.

"From the MIS point of view, the challenge we had in designing (the applications) was finding a cost-effective platform for high graphics, multiple databases and an expert system for a large number of users," said Tony Salmon, MIS director for Intelsat. "This is a very good example of where PC technology and micro-based servers are very cost-effective, compared to a mainframe."

At least 180 countries and territories clamor for satellite access from Intelsat, which now manages nearly 120,000 full-time communication channels and more than 100 full-time leases for television, domestic and specialized business applications.

MacLean said the process of scheduling a "clean" satellite with traffic now takes as long as three weeks — "assuming the phone doesn't ring and nobody walks in the front door" — but once the OPS software is on-line, that process can be handled in less than eight hours.

Planning has always been the special forte of the operations center, which manages a system controlling 2,200 separate communication pathways for international telephone, television, facsimile and data communications.

The actual operation and control of the satellites is handled by a separate engineering group, which relies mainly on minicomputers from Digital Equipment Corp. and Hewlett-Packard Co.

Aside from the member and nonmember countries served by Intelsat, its customers include all the major telecommunications firms and broadcast companies. "We needed to be able to respond to this large customer base more rapidly, and our current process on the mainframe was too labor-intensive and slow," MacLean said.

The move to a client/server architecture is intended to allow the operations center to take greater advantage of its corporatewide IBM Token-Ring network, which connects nearly 900 workstations and personal computers. The database server for the new applications will be a Compaq Computer Corp. Systempro, running Oracle Systems Corp.'s relational database management system, with multiple copies of Oracle on the workstations and PCs.

"We needed applications that would give the users more powerful tools, without the cost of making them so sophisticated that you need to be a technical wizard to operate them," said John Gulka, an MIS section manager for operations and engineering applications. "Over time, the functionality on the mainframes will go away and be replaced by these two distributed applications. But we still have to interface with existing components that won't migrate right away."

Data now held in an IBM DB2 database on the 4381s will eventually be moved to Oracle on the server.

This downsizing project has presented some daunting hurdles for MIS. Retraining the staff to use OS/2 in the application mode was a "significant technology transfer," Gulka said.

"I don't think anybody going into this understands it until they're in up to their eyeballs. It's not a cake walk," Gulka said. He noted that "a number of housekeeping functions" standard on the mainframes are now missing, and concerns have also risen over software version control on the server, plus overall security and backup issues.

"We rely heavily on network management and the technology specialty group that run our software integration lab to do crash-and-burn on the new stuff before it goes to the development team," Gulka said.

Discovering the benefits of recycling software

BY JOHANNA AMBROSIO
CW STAFF

In these green-minded times, recycling is starting to make its mark on software. Increasingly, information systems shops are designing software with reusable components that can be applied to many different programs.

Software reuse is not a new concept; the idea has been kicking around for a decade or longer. But it is only relatively recently that IS managers have started making it a reality.

Those who have started down this path say that it is well worth the time and effort, and it results in lower programming costs, greater freedom to develop creatively instead of having to reinvent the wheel and cleaner code that is much more manageable and maintainable.

The goal is to develop libraries of well-designed and tested software components for widely used functions such as file input and output.

There is a huge difference between this and what IS shops traditionally do, according to Rob Figliulo, president of SPR Inc., an Oak Brook, Ill., firm that helps companies develop reusable code. Taking old code and putting it wholesale into a new system is not the same as developing new and tested code or cleaning up the old code to make sure it really works.

"People reuse the code they've been using for 10 years. But some of that is filled with bugs and was designed with the constraints of the technology of the time," Figliulo said.

The decision of whether to use old code or new code to start a reusability library boils down almost to a religious debate. But either way, there are tools and techniques to help (see story below).

Some shops opt to do it manually. Cheryl Catanach, manager of data systems at A.M. Best Co. in Oldwick, N.J., said her company began developing reusable modules about four years ago. Catanach's group has responsibility for one of Best's product lines, an on-line database that contains information about insurance trends and companies.

She estimated that between 15% and 20% of the code for that system is currently in a modular form that has been reused in different parts of the application. At The New Brunswick Telephone Co. in Canada, about 10% of all lines of code are reused, systems architect Donald S. McLean said. "It does help a lot; we can reuse similar code and build systems in modules so we can throw out a piece of the system instead of having to rewrite the whole thing."

Still, McLean acknowledged, his system may not work at huge shops that may not even know what is in their several million lines of code.

Nor is software reuse appropriate for everyone. "I came here with the prejudice of having canned modules because that's what we did on my old job," said Nathan Lowell, manager of IS for Exchange Insurance in Buffalo, N.Y. "But my old shop was using all IBM equipment, so it was necessary. Here we're using Wang [Laboratories, Inc.] VS, which has a lot of code-generation facilities, so we don't really need a library of reusable functions."

Tools for reuse

Everything old can be new again. So say the proponents of reusing software components that are based on the existing code in an IS shop.

Some of the tools available to help do this include those that fall under the rubric of re-engineering packages. Included in this category are analysis tools for figuring out what code already exists and how to restructure it to make it better [CW, Oct. 22].

Vendors of these kinds of packages include Viasoft, Inc. in Phoenix; Language Technology, Inc. in Salem, Mass.; and XA Systems Corp. in Los Gatos, Calif.

Another tack is the methodology sold by Netron, Inc. in Toronto. Called Netron/CAP, the system provides for reusable code stored in structures known as "frames." These can be stored and recopied in whole or in part and then reassembled into Cobol programs. Users can write their own frames or modify existing ones to customize the program.

Or, if you'd rather buy the components already partially assembled, Software Architecture & Engineering, Inc., located in Arlington, Va., will provide them. The company sells approximately 100,000 lines of C code that users can customize with the firm's Snap tool kit.

The code is segmented into five generic modules, including data modeling, graphical user interface, communications and a knowledge-based component for building "smart" systems.

JOHANNA AMBROSIO

© 1990 Digital Communications Associates, Inc. All rights reserved. DCA is a registered trademark and IRMA, QuickScript, and Select are trademarks

For just $149 trade up to the most feature-rich 3270 connectivity solution for Windows 3.0

Now you can get IRMA WorkStation For Windows, a $495 value, for just $149. Just trade up from your old 3270 communications software – regardless of who you bought it from.

Return this card with a photocopy of your original master 3270 communications software disk. Offer valid until March 29, 1991. See back of card for further instructions.

☐ Yes, send me IRMA WorkStation For Windows for $149.00 plus $5.00 freight. (Both 3½" and 5¼" disks are included in package.)

Name _____

Firm _____ Phone _____

Address _____

City _____ State _____ Zip _____

Current 3270 Communications Software _____

IRMA WorkStation For Windows	$149.00	(Part Number 007921)	
Freight	5.00		
Sales Tax*	_____		
Total	$		66E

Upon receipt of IRMA WorkStation For Windows you will be asked to send in your original 3270 communications software master disk via traceable carrier. If not received within 30 days, you'll be billed for the full retail cost of $495.

Method of Payment

☐ Check enclosed ☐ VISA ☐ MasterCard ☐ American Express

Name on card (please print): _____

Card #: _____ Expiration Date: _____

Signature: _____

*State/local tax on product applicable in AL, AZ, CA, DC, GA, IL, KY, LA, MD, MN, NJ, NY, OH, OK, SC, VA. State/local tax on product and freight applicable in CO, CT, FL, IN, KS, MA, MI, MO, MS, NC, NE, NM, NV, PA, TE, TX, UT, WA, WI, WV. Customers that are exempt from paying state or local taxes must enclose a photocopy of their Tax Exemption Certificate with order.

HOW TO ORDER

By Fax: Fax photocopy of master disk and order form with charge card information to (404) 442-4366.

By Mail: Send in photocopy of master disk and order form with charge card information or check to DCA Response Center, ATTN: PCS 1000-214, 1000 Alderman Drive, Alpharetta, GA 30202-9902.

By Phone or Purchase Order: Call 1-800-289-4DCA 8 a.m. to 9 p.m. EST Monday-Thursday, 8 a.m. to 6 p.m. EST Fridays.

Shipments will be by ground carrier. Please allow 4 to 6 weeks for delivery.

DCA®

UK firms leery of object-oriented DBMSs

BY JASON THOMAS
IDG NEWS SERVICE

LONDON — UK companies are not yet rushing to embrace the heavily touted object-oriented database systems as the alternative to the traditional relational model, users and observers said.

While most firms are aware of the technology, they are not yet convinced that it is sufficiently advanced. But most are in no doubt that object-oriented databases are the way of the future.

Paul Harper, a technical analyst at UK chemical giant ICI, said the company had decided to adopt a "wait and see" approach. "We will be keeping an eye on it," he said, "but we are aware that it is not going to solve problems like easy maintenance, speed of production and easy understanding."

UK-based IXI's sales and marketing director, Anil Malhotra, said of the technology, "It's a bit 'sci-fi-ish' at the moment, but it is unquestionably the way databases will go in the future."

Hewlett-Packard Co. and Borland International are investing large amounts of money and reputation in the technology, with no guarantee of immediate commercial success.

A spokeswoman at UK-based Royal Insurance — which beta-tested HP's object-oriented-based New Wave 3.0 — said the firm has not looked seriously at object-oriented databases.

> WHILE MOST firms are aware of the technology, they are not yet convinced that it is sufficiently advanced.

"We have gone for the SQL model," the spokeswoman said. She added that since the independent relational database industry has recently been getting bad publicity, it may have rubbed off on object-oriented-based systems.

Harper added that the system his company was trying out is not currently meeting expectations. "We are having great problems just keeping it up and running at the moment," he said. "The technology is just not advanced enough yet."

Thomas is on the staff of PC Business World, *an IDG Communications British publication.*

For once, an announcement that will have businesspeople jumping into windows.

Until now, a lot of businesses have been hesitant to take the plunge into Windows. People have wondered, for instance, whether critical applications and viable communications would become available.

Well, if we may be so bold, we'd like to give you a little push – by introducing you to DCA®'s new IRMA™ WorkStation for Windows.

A BREAKTHROUGH IN 3270 CONNECTIVITY: IRMA WORKSTATION FOR WINDOWS.

In the Windows 3.0 operating environment, only IRMA WorkStation for Windows gives you a choice of single (CUT) or multiple (DFT) sessions via coaxial cable, remote SDLC or token-ring connections, as well as asynchronous connections.

It also gives you 3270 terminal, 3270 printer and asynchronous terminal emulations, and an extensive range of 3270 and asynchronous file transfer protocols, including DCA's and IBM®'s. Both DCA and IBM hardware are supported, as well.

All of which means that you won't have to keep reinvesting in new software as your business's needs change.

In addition to its tremendous flexibility, IRMA WorkStation for Windows is quite simple to use, which helps boost productivity.

For instance, mainframe data can be directly embedded into a word processor or spreadsheet, using DCA's QuickScript™ and Windows Dynamic Data Exchange.

Only IRMA WorkStation for Windows supports APPC and supplies you with a user interface that conforms to IBM's SAA/CUA standard. It also provides you with a transparent migration path to OS/2,® using DCA/Microsoft® Select™ Communications Workstation.

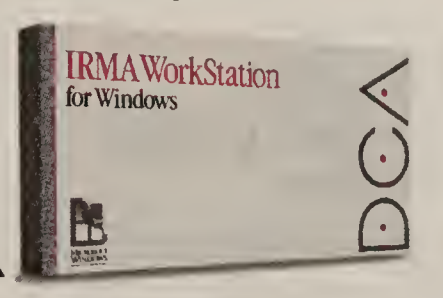
TRADE UP TO THE MOST FEATURE-RICH SOLUTION FOR $149.

Best of all, from now until March 29, 1991, we'll let you trade up from your old 3270 communications software – regardless of who you bought it from – for just $149 per unit (the suggested retail price is $495). For more information or to order, call 1-800-289-4DCA, ext. 66E (please have a photocopy of your master diskette on hand to fax in to DCA as proof of purchase).

It's easy. Just take a deep breath. Close your eyes, if you feel like it.

And jump.

DCA



of Digital Communications Associates, Inc. All other brand and product names are trademarks or registered trademarks of their respective owners.

Hamilton

CONTINUED FROM PAGE 27

Feraudo, vice president of IS. It was looking for help, period. In 1986, a decision was made to perform major surgery on the customer information system, which was built in the mid-1970s and had become a huge maintenance burden. Feraudo said the company looked at "CASE, AI, 4GLs, etc., and in the course of the research, we came across object-oriented [technology]."

The most appealing parts of object-oriented technology were its claims of reusability, easy modifications and less maintenance. While the other technologies promised some of those benefits, OOP seemed to be a combination of the three.

Feraudo and his team decided to give it a shot, which seemed like an odd choice. After all, Brooklyn Gas was at the time and is today a big IBM mainframe shop. In 1986, OOP was used mostly on an experimental basis and was stricly a PC tool. But Feraudo said he believed he could transfer the object-oriented methods to his mainframe environment.

The first step was to mess around with an OOP. The company selected Smalltalk, an obvious choice because this is the original OOP language, developed in the 1970s at Xerox Corp. Brooklyn Gas "tested it extensively on a PC" and then decided it was ready for a pilot project on the mainframe.

The problem was that there was no OOP for mainframes. Feraudo maintained this wasn't a significant issue. Again, the idea was to use OOP techniques.

Brooklyn Gas did its mainframe programming in PL/1. The pilot, designed for a caching process, was completed in 1988. The company was now ready for the customer information system. Feraudo had 200 programmers working on the project. The idea was to isolate the business processes related to customer management, be it billing or meter reading. Each was reduced to a single object, which included the related data and processes associated with it.

Feraudo said the objects are typically only 20 lines of code. But it took the 200 programmers 2½ years to complete this. While the end result of OOP is a more simplified software, the process is tremendously difficult. It required an entirely new way of thinking about data and its functions, Feraudo said.

Earlier this year, Brooklyn Gas went live with its object-oriented-based customer information system and reports no major problems. The software serves as the company's primary system to manage all customer-related business.

Hamilton is a *Computerworld* senior editor, systems and software.

©1990 AT&T

For on-demand, high-speed data trans

Only AT&T ACCUNET® Switched Digital Services lets you transmit data on a dial-up basis to just about anywhere.

Maybe you need to send bulk data to Denver but Denver's not on your private network. With AT&T ACCUNET Switched Digital Services, you can do it as often or as infrequently as you like without adding a new location to your network.

SDS is a fully supported public network designed and maintained for switched digital service. And it's the only one of its kind.

It's not just limited to 56 kbps, either. You can use SDS for speeds of 64 and even 384 kbps. And whether you need us for video conferencing, high-speed facsimile, peak-time overflow, Image Retrieval or CAD/CAM, you can transmit data to just about anywhere outside of your network. Even France, Japan, Jamaica, Australia, the U.K. and Singapore.

mission, no one goes as far as AT&T.

So if your private network doesn't always go as far as you'd like, give us a call. We'll help you expand your horizons.

Flexibility.
Another AT&T advantage.

For more information about AT&T ACCUNET Switched Digital Services, call your AT&T Account Executive or 1 800 247-1212, Ext. 150.

AT&T
The right choice.

Software streamlines S&L's task

BY SALLY CUSACK
CW STAFF

NEVADA, Mo. — While the savings and loan crisis is making headlines in the national news, Farm and Home Savings Association here in the Midwest has committed to a software package designed to make loan collections a little bit easier.

According to Michele Stubblefield, manager of systems liaison, acquisitions and training at Farm and Home, the bank has survived the S&L crisis intact.

Farm and Home has approximately 50 branch offices located in Missouri and Texas. It employs 600 people and reported $3 billion in assets for 1989. The bank relies on an IBM 3090-120E mainframe for processing savings account information and runs all mortgage and mortgage-related services on an IBM Application System/400 B50 midrange computer.

Earlier this year, Farm and Home contracted with Stockholder Systems, Inc., a financial software company based in Norcross, Ga., to provide a loan servicing system and a bankruptcy module to replace the outdated software the bank had developed in-house.

Midrange move

The in-house package had been running on the mainframe for several years when the bank decided it was time to move the mortgage services to a commercial package on a midrange platform.

"We're doing a lot of loan acquisition, and we really needed something with good reporting capability," Stubblefield said.

There are 76 employees routinely accessing the Loan Servicing Accounting Management System (LSAMS) and the Bankruptcy Management System via AS/400 terminals.

Stubblefield characterized the purchases as "very beneficial" for the bank.

"With any bankrupt organization, you want to get them out of bankruptcy and either into foreclosure or a reinstate status," she said, noting that the bankruptcy module "gets things to court much faster" via event tracking reporting functions.

Before the bank installed Stockholder Systems' LSAMS software in April, employees manually typed out all necessary forms, including monthly credit reports, tax information and U.S. Department of Housing and Urban Development reports.

With LSAMS, the system calculates data and holds it in files until it is put out in hard copy or tape formats, Stubblefield said, adding that savings in employee production hours has been "increased dramatically."

The software offers loan setup, file maintenance and payment processing facilities in addition to a word processing module that automatically sends letters to delinquent accounts.

The Bankruptcy Management System tracks all attorney

Farm&Home Savings

activity and all applicable dates, as well as providing event tracking functions with automatic document generation. The software automatically generates delinquency reports and allows on-line, real-time updating of all information.

Prior to purchasing the bankruptcy module, employees at Farm and Home tracked bankruptcies on index cards. According to Stubblefield, when the bank was cleaning out the old card system and entering the data into the computer, they found 82 outdated cases that were never purged from the files, a situation "that would have never happened with the event tracking module," she said.

Stubblefield, who has been with Farm and Home for 11 months and has worked in bankruptcies for six years, said she feels that Stockholder Systems has offered excellent training and support throughout the entire endeavor.

The bank sent eight of its supervisors to Stockholder Systems' headquarters for training, she said, and the company spent three weeks on-site at Farm and Home.

She also indicated that the vendor devoted time to one-on-one training within the various departments, working both with users and systems programming personnel.

Servio tools extend 4GL bridges to 'outside world'

BY JEAN S. BOZMAN
CW STAFF

ALAMEDA, Calif. — Servio Corp. says it has built a better way for users to access its Gemstone object-oriented database management system. A new collection of fourth-generation language (4GL) tools called Facets will create object-oriented code in Parcplace Systems, Inc.'s Smalltalk-80 programming language.

The arrival of the new tools is seen as a lifeline to other vendors' products, industry analysts said. That is because 8-year-old Servio's database engine is a unique design and can only be accessed through database-specific interfaces. In order to grow beyond its small installed base, Servio must "break out" into the larger world, said Tom Sawyer, a database analyst based in San Jose, Calif. So far, Servio developers have built software bridges to Sybase Corp.'s relational DBMS and to Neuron Data, Inc.'s Nexpert Object expert system.

Crossing boundaries

Servio developers acknowledged the need to break out of proprietary-software boundaries. "Since Facets is written in Smalltalk-80, our [Servio] product is portable to the extent that Smalltalk-80 is portable," said Richard Auslander, Facets' product manager. "In theory, we run on every platform they do."

The new Facets modules are intended to speed development of Gemstone-based applications — boosting programmer productivity by 10 times or more in some cases. The product suite has been tested at 15 customer sites in recent months, Servio said.

The 4GL code generator turns out object-oriented code based on user selections from menus and user specifications. Training, however, is expected to be minimal. "No Smalltalk programming, as such, is required," Auslander explained. "Users can draw forms and paint on-screen elements by selecting items from a menu. The goal is to have a tool that allows the end user to participate in the development process."

Special hypertext features allow programmers to create Help features as they write their Gemstone-based programs, Auslander said. The programmers themselves can use the 200-plus hypertext statements included in Facets to get a running start on end-user documentation.

Facets modules include Schema Designer, which creates new classes of objects; Forms Designer, which allows users to create icon-based or forms-based screens by example; Report Writer, which specifies printing formats for output; Menu Builder, which helps programmers create pop-up windows and pull-down menus; and a "Help author," which aids the creation of Help features with hypertext. Users can click on the bold-faced hypertext words to find additional, nested explanations. The entire Facets package is priced at $1,000 per copy.

Insurer tests integrated claims system

BY SALLY CUSACK
CW STAFF

HARTFORD, Conn. — An application integrating text, data, image and voice processing components into a single transaction environment will soon be pilot tested at the 42-person Pittsburgh claim office of ITT Hartford Insurance Group.

Scheduled to begin early next month, the six-month pilot project is the result of a strategic alliance between The Hartford and Wang Laboratories, Inc. in Lowell, Mass.

The work management application was jointly developed by Wang and The Hartford, and the system runs on the Wang Integrated Image System, which is based on Wang's VS-based midrange computers and uses the Wang Pace database management system.

According to Robert R. Lukas, assistant vice president of information systems at The Hartford, the new system will provide a better opportunity to examine the entire claims processing work flow and will offer benefits both internally and to customers.

Paper in, data out

Using the integrated, image-based application, incoming paperwork, such as customer correspondence, standard insurance forms, doctors' reports and repair estimates, can immediately be scanned into the system and entered into electronic files.

Application features include a work measurement facility designed to allow end users to measure the exact time spent on individual tasks.

Referring to cost justification for the project, Lukas indicated that "part of our pilot exercise is to validate our cost benefits." He added that while the company expected dramatic increases in productivity, no job cuts were anticipated.

Using the new system, claims handlers and supervisors can simultaneously access electronic files via image-capable personal computers equipped with Wang's Freestyle PC software program. Freestyle allows users to insert handwritten, spoken or typed annotations to be added to the images during the claim handling process.

In addition, field agents can access the claim information database and receive voice message updates on claim activities by using a Touch-Tone telephone.

Foreign intrigue buoys midrange vendor

BY MARYFRAN JOHNSON
CW STAFF

WALTHAM, Mass. — IPL Systems, Inc., a storage and peripherals vendor for the IBM midrange, will announce $45 million worth of distribution agreements with seven Western European systems vendors this week.

Ing. C. Olivetti & Co. accounts for at least half of the distribution deals, IPL officials confirmed.

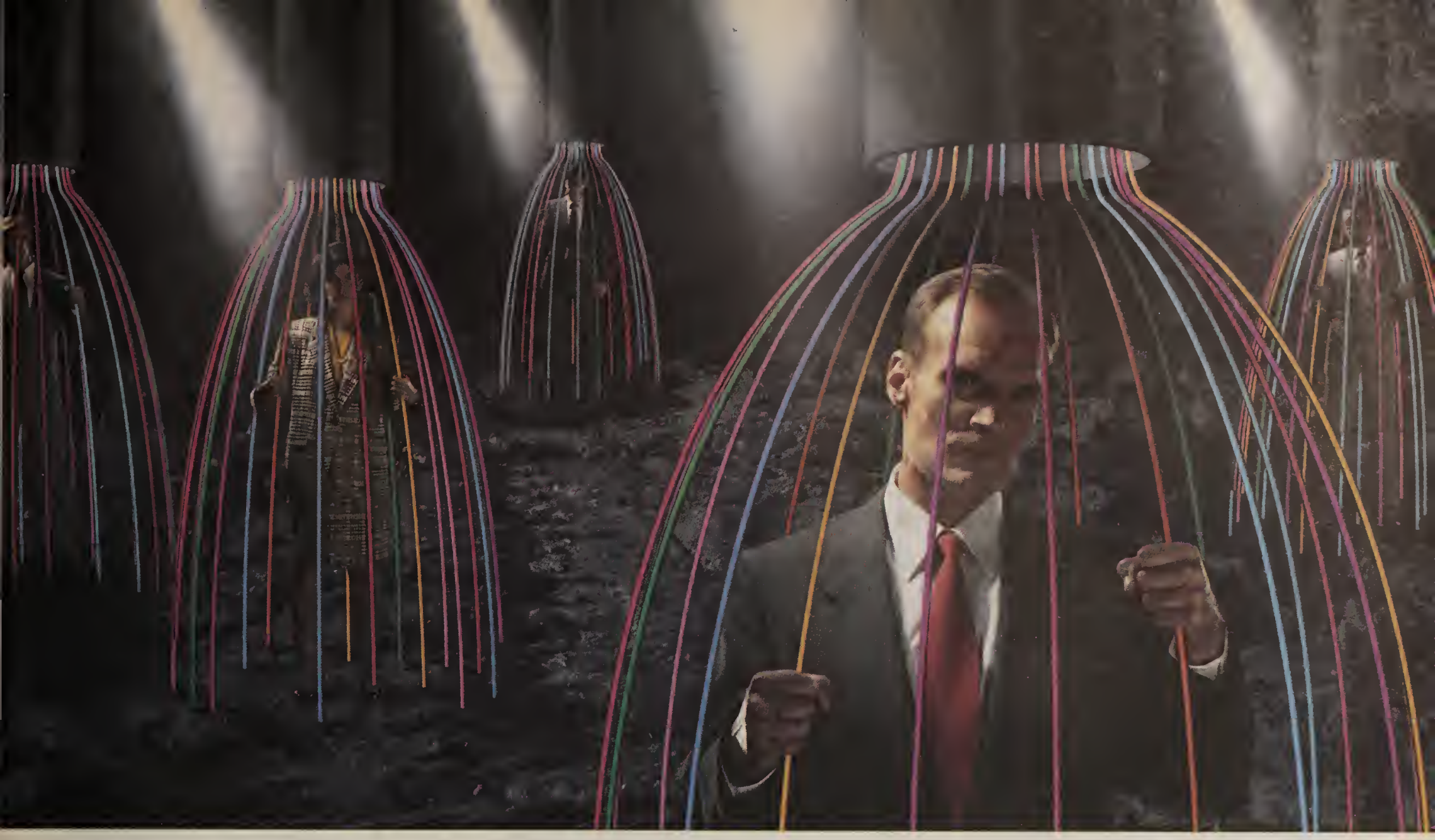
IPL President Robert W. Norton said the European deals — ranging from one to three years — should sew up the company's position as IBM's largest competitor abroad in the memory, tape-drive and disk-array market for IBM's Application System/400 and other midrange systems. In 1990, IPL sold $23 million in peripherals to IBM midrange customers.

IPL has found the European climate quite hospitable since 1988, when it sold $3 million worth of peripherals abroad. This year, the company expects its direct sales to exceed $12 million in Europe, according to Norton.

"The distributors we have agreements with are the largest and most powerful group of distributors in Western Europe, and some will carry IPL on an exclusive basis," Norton said. He added that IPL is reaping the benefits of a continued strong demand in Europe for the AS/400, where IBM ships about 60% of the AS/400s currently on the market.

Norton said the clearest difference between IPL's U.S. and European customers is that the Europeans are getting "more product for the same money" because of the weak U.S. dollar.

Last September, IPL introduced its 7636 Disk Array, a 1.8G-byte array for AS/400 Models B30 through B70. It features IBM-manufactured disks that are faster and roughly 25% cheaper per 1M byte than IBM's own 9336 disk products. Norton said IPL will announce enhancements to the 7636 array in the first quarter of 1991.



Is your fractional T-1 network too confining?

Only AT&T ACCUNET® Spectrum of Digital Services offers you the exact capacity and bandwidth you need to more than 500 locations nationwide.

Choose AT&T as your fractional T-1 vendor and you won't be locked into a network that limits your options. Because with more than 500 locations nationwide, AT&T's ACCUNET Spectrum of Digital Services (ASDS) gives you the freedom to send voice, data and images to more locations than anyone else.

And that's not the only way you benefit from ASDS' extensive network. Along with more locations, we also have many more back-up routes available through our diversity options. Which means ASDS can also provide protection for your critical applications like no one else.

For most businesses ASDS' extensive network translates into lower access charges, too. That's because we're closer to more customers than our competitors.

You won't find an easier service to hook into, either. Whether you have Analog Voice Grade Private Line, ACCUNET T1.5 or single channel digital access at 9.6 or 56 kbps, getting access to ASDS couldn't be simpler.

So if you're feeling cramped by your network's reach, give us a call. We've got just the thing to break you out.

Service. Another AT&T advantage.

For more information on AT&T's ACCUNET Spectrum of Digital Services, call your AT&T Account Executive or 1 800 247-1212, Ext. 107.

AT&T

The right choice.

© 1990 AT&T

HARD BITS

EMC offers another DASD alternative

EMC Corp. continued the rollout of its mainframe direct-access storage device alternative with last week's announcement of a lower-end model in its Symmetrix Series of Integrated Cached Disk Arrays.

Model 4204 offers 4G bytes of disk storage, up to 1.5G bytes of cache and an IBM 3880/3990-type storage controller within a 3½-sq-ft cabinet. The Symmetrix series, which was introduced by the company in September, is an initial implementation of the redundant arrays of inexpensive disks storage concept.

IPL Systems, Inc. announced a service contract last month with Richard Besner & Associates Ltd., one of Canada's larger computer maintenance firms, for support of IPL products on IBM midrange systems. Besner & Associates will provide maintenance and on-line diagnostic services to more than 3,000 Canadian sites.

Convex Computer Corp. will provide its users with a tape library interface that allows C2 series supercomputers to connect to a Storage Technology Corp. 4400 Automated Cartridge System. Availability is scheduled for next year.

Sentinel Computer Services expanded its hardware support services to include water-cooled IBM mainframes. The company has been servicing air-cooled IBM mainframes as well as lower-end equipment and peripherals.

Distributed Logic Corp., or Dilog, in Anaheim, Calif., has been granted an unlimited VAXBI license by Digital Equipment Corp., which allows the company to use DEC's VAXBI interconnect technology in host computer adapters for attaching disk and tape storage subsystems to DEC computers. The first product marketed under the new agreement is Dilog's RTS 3480 series of IBM 3480-compatible cartridge tape subsystems for use with VAX computers.

After Trying Our Business Software, American Tourister® Sent The Others Packing.

It was an open and shut case. Only our *Financial, Human Resources* and *Environmental Management* software for the IBM AS/400 provides you with the mainframe functionality and PC ease-of-use necessary to let you get more work done.
That's why our midrange solutions are being chosen by more and more Fortune 1000 corporations.
Free White Paper Offer: For more information and a free copy of a white paper entitled, "Transparent Technology: Getting *Your* Work Done In The 90s," call 1-800-388-2000.

Software 2000
The Difference Is Expertise.

ATLANTA • BOSTON • CHICAGO • LOS ANGELES • LIMERICK • LONDON

1800 Series Concept Collection from American Tourister IBM and AS/400 are registered trademarks of International Business Machines Corporation.

SOFT NOTES

Interleaf, DG make a match

Interleaf, Inc. has announced an OEM agreement with **Data General Corp.** to port Interleaf's publishing software to the DG Aviion line of Unix-based reduced instruction set computing (RISC) workstations. Interleaf software for the Aviion platforms will ship in spring 1991.

Objectivity, Inc. in Menlo Park, Calif., has announced it will market its engineering database management system, Objectivity/DB, for the **IBM** RISC System/6000 line during the first quarter of 1991. The move extends Objectivity's support for distributed networks of heterogeneous workstations. The product currently supports Sun-3 and Sun Sparcstations from **Sun Microsystems, Inc.** and **Digital Equipment Corp.** RISC-based Decstations.

Sales of geographic information system (GIS) software shifted sharply to workstation-based systems in 1989, growing by 82% to more than $123 million, **Daratech, Inc.** in Cambridge, Mass., reported recently. For overall GIS software revenues, workstations now make up 55% of the total $223 million for 1989, with personal computers accounting for 23%, and midrange or mainframe hosts accounting for 22%.

DEC will become a marketer of MAC-PAC/D, an integrated manufacturing planning and control system from Chicago-based **Andersen Consulting**, DEC said last week. A $200,000 version of MAC-PAC has been ported to DEC's VAX systems.

Computervision releases long-awaited Medusa revision

BY SALLY CUSACK
CW STAFF

DETROIT — Computervision, a Prime Computer, Inc. company, rewarded approximately 9,500 eager customers last week by unveiling the long-promised Revision 12 of Medusa at the Autofact show.

The latest version of the computer-aided design and manufacturing (CAD/CAM) software package, two years in development, features full 32-bit integer and double-precision storage as well as a proprietary database. It unites the two pre-existing versions: CIS Medusa Revision 7, which runs on the Digital Equipment Corp. VAX platform; and Prime Medusa Revision 5, developed to run on the Prime 50 series, Tektronix, Inc. workstations and Sun Microsystems, Inc. Sparcstation platforms.

According to Gisela Wilson, an analyst at International Data Corp., a market research firm in Framingham, Mass., Medusa is a "very solid and very widely respected product," and the latest announcement reinforces the package as a strong, midrange CAD contender.

Bob Manning, senior CAD analyst at AMP, Inc., a Harrisburg, Pa.-based electrical and electronic connection device manufacturer, said the latest release delivers on several promised enhancements essential to the manufacturing company's CAD/CAM procedures. AMP, a Prime customer for 10 years, has a sizable Prime Medusa population operating on Prime 50 series and Sparcstation computers.

"Our biggest concern was the double-precision accuracy. Prior to this release, we were losing accuracy down at the third decimal level in geometric applications. Now we have accuracy down to the 10th decimal when transporting the numbers to our Prime GNC CAM package," Manning said.

Gene Daniels, Medusa system administrator at Genrad, Inc. in Concord, Mass., has been beta-testing Revision 12 since July in a CIS Medusa Revision 7/DEC Vaxstation environment. Genrad, a supplier of integrated software systems and automatic test equipment, uses the product primarily for two-dimensional engineering drawings and 3D modeling.

Daniels noted that while Genrad is pleased with the double precision accuracy included in the latest release, the company was especially interested in the geometry transformation enhancement, which allows the user to copy geometry within a sheet.

Slated for delivery next month, Medusa Revision 12 runs in VMS, Primos and Unix operating environments. The average price per seat, including both hardware and software, ranges from $30,000 to $35,000.

Computervision also announced Medusa Design, an integrated software that runs on the Sparcstation platform and was designed to provide users with an interactive 3D design modeling system for mechanical design applications.

Transform Logic offers CASE tool

SCOTTSDALE, Ariz. — Transform Logic Corp. recently made its second big move to expand beyond the application generator market by announcing a reverse-engineering tool for both Cobol and IBM JCL code that runs on a personal computer.

Last year, the company acquired Nastec Corp., a supplier of front-end computer-aided software engineering tools.

Touting itself as a work-group tools company, Transform Logic earlier this month released its reverse-engineering tool, Source/RE, which will initially hook into the Nastec product, Design Aid II. The company also plans to provide hooks to its own application generator as well as IBM's Cross System Product (CSP) in 1991. Transform Logic has been developing CSP with IBM for two years.

Source/RE, which will eventually be offered for the IBM OS/2 platform in addition to Microsoft Corp.'s MS-DOS, is intended to help users maintain and rewrite existing applications.

The company said Source/RE reduces the amount of time required to figure out a Cobol program module by representing its logic with graphics and reports. The software can also produce summary reports that would give an overall snapshot of a program, including the total number of code lines and blank lines.

Initially, users will be able to incorporate Source/RE data into Design Aid II. For example, a user could use Source/RE reports on existing code to determine what changes are needed and create those extension codes with the front-end design tools. Next year, users will be able to load Source/RE data into either the Transform Logic application generator or IBM CSP to produce Cobol code.

Transform Logic will offer Source/RE as a stand-alone PC product with a license fee of $3,800. A local-area network license is also available for $9,600.

A laptop deal that will make you do a double take!

ZENITH DATA SYSTEMS INNOVATES AGAIN™

The Double Take Deal—Buy a Zenith Data Systems VGA laptop PC and get a NovAtel HardPac™ transportable cellular phone. A $799 retail value!

Here's a deal so great, you'll look once, and then again!

It starts with one of these VGA laptop PCs from the number one laptop brand in America* The SupersPort® SX, giving you Intel386SX™ performance for advanced applications. The SupersPort 286e, with the speed and power to tackle huge spreadsheets, files and databases. Or the new SlimsPort™ 286, the 9¼ pound laptop with full-size 286 performance. All feature VGA graphics and Zenith Data Systems' *Intelligent Power Management™ System* that lets you control battery life.

Simply buy one, then, you'll receive a NovAtel HardPac transportable phone** at no extra charge! It has 3 full watts of power, handsfree operation, and stores 99 frequently called numbers.

So maximize your productivity on the road by turning your travel time into work time. Take us up on the Double Take Deal! Call now. **Offer ends December 31, 1990.** For more information and the name of the Zenith Data Systems Medallion Reseller nearest you, call

1-800-523-9393.

ZENITH data systems
Groupe Bull

*Source: 1990 Dataquest estimate for U.S. battery-powered laptops. **Subject to credit approval, a six month service commitment with GTE Mobile Communications, and the completion of a liability release. A deposit may be required. Offer void where prohibited and where activation requirement is prohibited by state law. See complete rules for details at participating Medallion Resellers. HardPac is a trademark of NovAtel Carcom, Inc. Intel386SX is a trademark of Intel Corporation. Graphics simulate Microsoft® *Windows™ version 3.0*, a product of Microsoft Corporation. *Intelligent Power Management* is a trademark of Zenith Data Systems Corporation. © 1990 Zenith Data Systems Corporation

NEW PRODUCTS — SOFTWARE

System software

Sequoia Systems, Inc. has announced a multilevel security option for Unix that is available for multiprocessor fault-tolerant computers.

Secure Topix was designed to provide data security for on-line transaction processing environments in which access to sensitive data needs to be strictly controlled. The product was developed with AT&T Bell Laboratories' Security Systems Division and complies with AT&T's Unix System V Release 3. The product is scheduled to begin shipping next month. Pricing starts at $30,000.

Sequoia Systems
300 Nickerson Road
Marlboro, Mass. 01752
(508) 480-0800

Applications packages

DK Systems, Inc. has added an enhanced time and materials billing support feature to DK Inventory Manager, a Wang Laboratories, Inc. Professional Application Creation Environment database application that helps information systems managers and operations support staff manage and control their multivendor computing environments.

The time and materials billing support feature facilitates the immediate reconciliation of maintenance invoices with their related service calls and automatically totals maintenance costs directly against the specific hardware items for which they were incurred.

The product costs $10,000.

DK Systems
1455 N. Sandburg Terr.
Chicago, Ill. 60610
(312) 943-7744

Unitech Systems, Inc. has announced Release 2.8 of its Unitech Audit and Control Reporting System (U/ACR), a product that enables users of IBM MVS and VSE machines to automatically capture, verify and reconcile data from report and data files and application programs.

The product is a batch application that enables users to capture data directly from DB2 tables without having to make any program changes or code any SQL queries, the vendor said.

License fees for U/ACR Release 2.8 range from $29,950 to $52,000, depending on operating system and CPU size.

Unitech Systems
3030 Warrenville Road
Lisle, Ill. 60532
(708) 505-1800

EPS Software Consultants has launched Version 2.8 of its FCS financial support software for IBM System/370 mainframes operating under VM and MVS.

The product supports direct data transfers between FCS and Pilot Executive Software's Command Center. Other features include Databuild, a facility that guides users through the process of building multidimensional models; Optimize, a linear programming module for solving simultaneous equations that contain indefinite rules; and Builder, which enables novice users to create simple reports.

Pricing starts at $40,000.

EPS Software Consultants
Mississauga Executive Center
Two Robert Speck Pkwy.
Mississauga, Ont.
Canada L4Z 1H8
(416) 279-8711

Geoscan Corp. has begun shipping an upgraded version of its David Plot Server, designed for performing network applications on Digital Equipment Corp. VMS and VAX systems.

The new version, called the Master Plot Server system, can be used to drive plotters at a rate that yields 200 to 800 dot/in. black-and-white, color and single-pass color outputs, according to the vendor.

The product's price ranges from $10,000 to $30,000, depending on CPU size and options purchased.

Geoscan
Lake Pointe Plaza
One Fluor Drive
Sugar Land, Texas 77478
(713) 263-4196

Software Components of Colorado, Inc. has announced an updated version of its Window Management System, a software package designed to allow programmers to build windows-based applications on VAX/VMS computers.

Version 3.0 includes default programmer setups, a VMS object library interface and a VMS text library interface. It also features 11 programmer-defined function keys and rewritten Help libraries.

Pricing ranges from $1,500 to $7,500, depending on configuration.

Software Components of Colorado
6575 Denim Drive
Colorado Springs, Colo. 80918
(719) 531-6940

Utilities

System Industries has introduced a disk performance monitoring tool designed for Digital Equipment Corp. VAX/VMS systems.

The Diskview Performance Monitor can be used to collect and report disk activity data by file, device or process.

It enables systems managers to disperse data equally across a group of disks and eliminate bottlenecks caused by disk overuse, the vendor said.

A single-node VAX license is priced at $1,490.

A Vaxcluster license sells for $3,790.

System Industries
560 Cottonwood Drive
Milpitas, Calif. 95035
(408) 432-1212

Cincom Systems, Inc. has announced a software interface designed to link Cincom's Control: Manufacturing business application software package with external systems.

Control:Link enables users to link Control:Manufacturing with computer-integrated manufacturing applications without making it necessary to modify current Control:Manufacturing programs.

The product can run on IBM mainframes and Digital Equipment Corp. VAX systems, according to a spokesman.

Pricing ranges from $11,000 to $76,000 for VAX platforms and from $18,000 to $87,000 for IBM mainframes.

Cincom Systems
23000 Montana Ave.
Cincinnati, Ohio 45211
(513) 662-2300

NEW PRODUCTS — HARDWARE

I/O devices

Aptec Computer Systems, Inc. has announced the latest member of its I/O Computer (IOC) product family.

The IOC-100 is a midrange system that features a sustained bandwidth of 100M byte/sec. and support for up to 256M bytes of memory. Other features include support for 16M-, 64M- or 256M bytes of shared dynamic random-access memory and nine slots for user interfaces or special-purpose processors. It also supports Digital Equipment Corp. VAX/VMS environments.

Pricing is $74,500 for a 16M-byte version, $110,950 for a 64M-byte unit and $252,150 for a 256M-byte model.

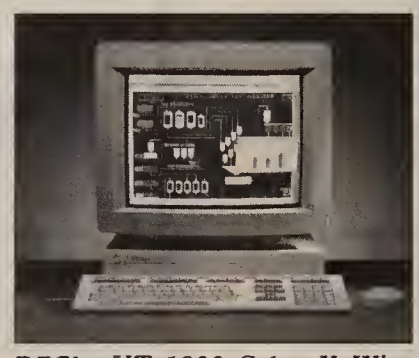
Aptec Computer Systems
P.O. Box 6750
Portland, Ore. 97228
(503) 626-9000

Digital Equipment Corp. has announced a terminal equipped with an interface that lets users access over 6,000 VMS applications and over 1,000 Ultrix and Unix applications.

The VT 1300 Color X Window terminal features a VR320 19-in. color monitor that provides 1,280- by 1,024-pixel and 100-dot/in. resolution at a 66-Hz refresh rate. It includes 8M bytes of memory and a built-in switch for connecting to thin- or thick-wire Ethernet networks.

The terminal is priced at $7,495. VMS host versions began shipping in mid-October, and Ultrix host versions are slated to ship in mid-December.

DEC
146 Main St.
Maynard, Mass. 01754
(800) 344-4825



DEC's *VT 1300 Color X Window terminal*

Sigma Information Systems has announced an updated version of its Q-bus to ESDI disk controller that features 16M-byte cache/random-access memory capacities.

Model SDC-RQD11-EC Plus is a quad-height controller designed to interface up to four enhanced small device interface drives to Digital Equipment Corp. Microvax II, Microvax III and LSI-11 systems. It can also support data transfer rates of up to 24 MHz, according to the vendor.

The product lists at $1,923 for a Microvax II/LSI-11 version and $2,175 for a 2M-byte Microvax III version.

Sigma
3401 E. La Palma Ave.
Anaheim, Calif. 92806
(714) 630-6553

Univision Technologies, Inc. has introduced a single 6U-size board graphics controller designed for VME-based systems.

The UDC-6000-TI, the latest member of Univision's Piranha family, includes a Texas Instruments, Inc. TMS34020 graphics controller and an optional TMS34082 floating-point unit. The board features 40 million floating-point operations per second and a vector drawing speed of 200,000 vector/sec.

The product can also display 1,600- by 1,200- by 8-bit images from a display memory of 2,048 by 2,048 by 8 bits, the vendor said.

Pricing begins at $4,895.

Univision Technologies
Three Burlington Woods
Burlington, Mass. 01803
(617) 221-6700

Data storage

NER Data Products, Inc. has announced Qwikscan, an OS/2-based management system designed for controlling daily tape operations.

The product enables users to scan 4,000 to 6,000 tapes per hour and quickly track off-site tape movements. It also facilitates vault processing and library or vault audits.

A basic unit comprises two intelligent visible laser diode guns, a programmable data collection device and a Qwikscan system software package. The product is priced at less than $15,000.

NER Data Products
412 S. Delsea Drive
Franklinville, N.J. 08322
(609) 694-2764

Let CICS Manage Itself

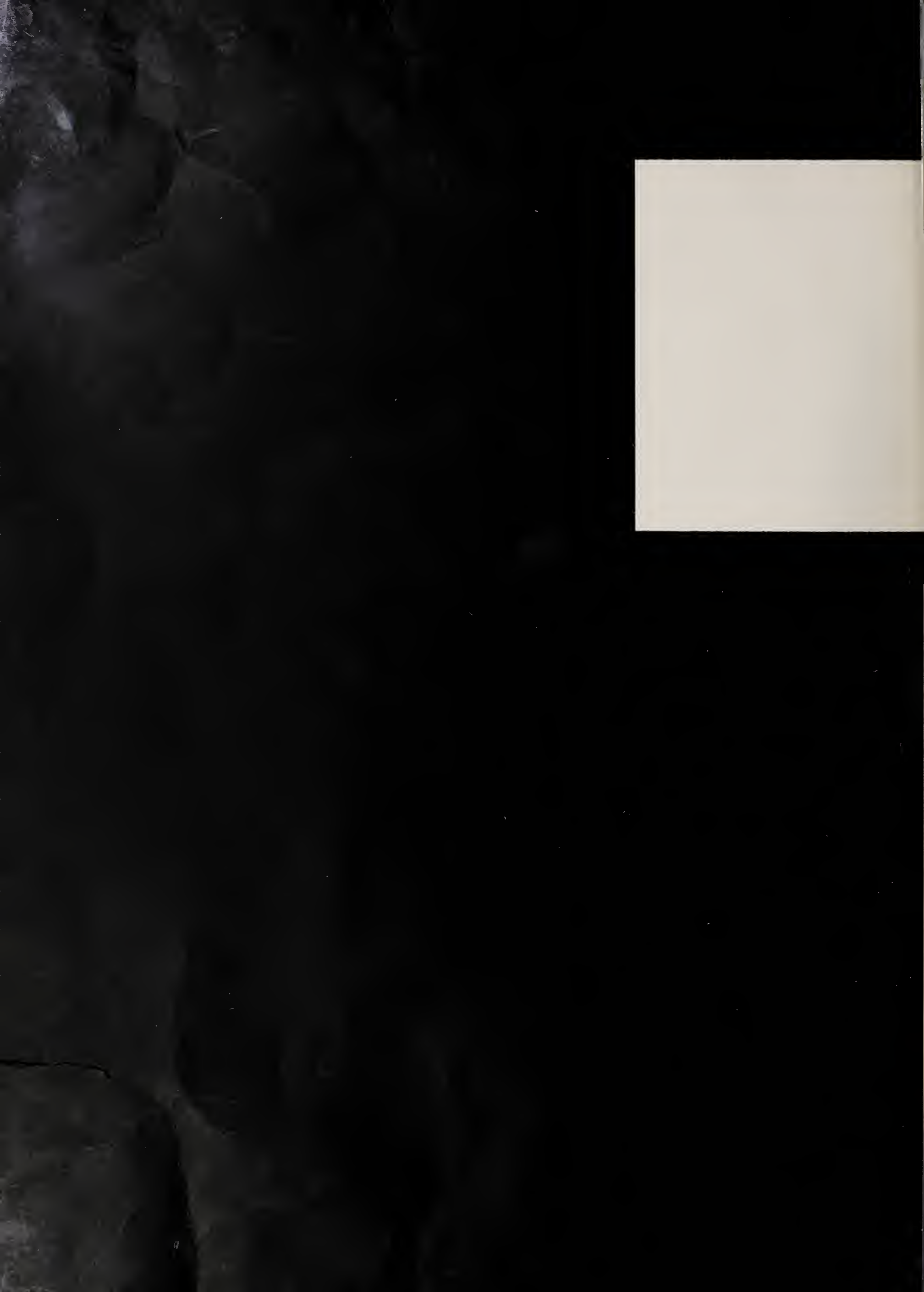
Automate Your CICS Regions with AOEF

- Start, stop and recover CICS regions.
- Time initiate transactions, batch job support and CEMT commands.
- Monitor and correct terminal status.
- Trigger journal jobs on demand.
- Ship early problem warnings to consoles, TSOids and to the HELP desk.
- Respond to CICS's WTOs, WTORs, abends and log messages with MVS activities, predefined WTOR responses and corrective CEMT commands.

The CICS Automated Operations Extension Facility is a proven approach to system managed CICS resources. Call us today for more information or a trial for AOEF

NETEC

Netec International, Inc.
P.O. Box 180549 • Dallas, TX 75218
Telephone (214) 343-9744
FAX (214) 343-9009 • TLX 314419



Putnam 'goes live' with Imagelink

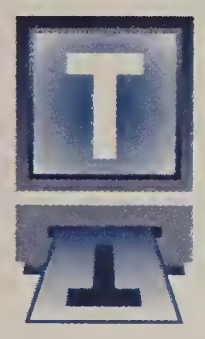
BY SALLY CUSACK
CW STAFF

BOSTON — The addition of a sophisticated scanner from Eastman Kodak Co. is allowing The Putnam Companies of Boston, a national investment management firm, to realize 20% to 40% productivity gains with its IBM Imageplus System.

According to Gavan Taylor, senior vice president at Putnam Investor Services, the company "went live" with the Kodak Imagelink Scanner 900 a few weeks ago, effectively quadrupling the number of documents scanned by achieving a production rate of almost 500 pages per hour.

Putnam, which has more than $42 billion in assets under management in mutual funds and pension accounts for many Fortune 1,000 companies, was the first company to install the Kodak scanner.

Coincidentally, the firm also claims to be the first financial services institution to install the IBM Imageplus System. In this case, first appears to be best, as Taylor indicated that the combined technology has dramatically increased customer service levels by eliminating paper handling and turning data entry personnel into "decision-makers."



"IBM and Kodak worked together with us to interface the Imageplus software with the scanner," Taylor said. "Now our mailroom people scan in all documents between 4 a.m. and 8 a.m. each day, and when the customer service staff arrives, all data is on-line, ready for resolution."

Putnam has been running the Imageplus in an IBM 3090-200S environment, with over 200 IBM Personal System/2s, for more than a year. The company is upgrading to a 300J-class mainframe and plans to increase the workstation count to 350 by first-quarter 1991. Before acquiring the Kodak scanner, the company relied on scanning equipment from Bell & Howell Co.

"The technology has provided job enrichment for our employees and better service for our customers," Taylor said. He added that the firm is conducting a review process to translate productivity gains into cost savings.

EC to adopt copyright directive

Protects software for 50 years, sets limits on reverse engineering

BY ELIZABETH DE BONY
IDG NEWS SERVICE

BRUSSELS — A directive guaranteeing 50-year copyright protection for software programs throughout the European Community (EC) is expected to be adopted at the Dec. 13 meeting of the EC's internal market ministers.

To meet this objective, the commission and national experts will have to make a major effort during the coming weeks to draft a provision on reverse engineering. This provision should establish the right balance between protecting authors' rights and ensuring interoperability of programs and equipment throughout the EC, Internal Market Minister Martin Bangemann explained earlier this month following an EC council meeting.

Reverse engineering permits a manufacturer to decompile or dismantle a competitor's program into its component parts with a view to writing compatible software or building compatible equipment. The optimism about a December adoption, expressed by Bangemann, Italian Minister Pierluigi Romita, UK Trade Secretary John Redwood and French sources, stems from the fact that during this month's meeting, the ministers seemed to have found solutions for two minor problems concerning rental rights and the duration of copyrights.

More important, however, ministers said there is a consensus that the directive should authorize reverse engineering by way of a derogation to copyright protection. That would be permitted in certain well-defined circumstances — either to promote interoperability or for certain maintenance purposes.

According to Bangemann, the drafting exercise will entail finding the right definitions for maintenance and the limits of interoperability.

The key questions concern whether maintenance should be limited to simply a correction of errors, as proposed by the commission, or whether it should have a broader definition and whether the interoperability justification can be used by manufacturers to enable them to write competing programs that would simply act as a substitute for the original program.

According to Redwood, there was a wide range of opinion concerning these two issues based on whether a member state has an existing software or hardware industry that wants to protect its creations or whether it has an emerging industry that wants access.

Industry reaction remains mixed. Philippe Wacker, a consultant for the European Committee for Interoperable Systems (ECIS), said any limits on the definition of maintenance would be unacceptable, and a ban on competing programs would have "dramatic consequences for compatible personal computer makers" in Europe.

ECIS represents roughly 70 software and hardware manufacturers, including Italy's Ing. C. Olivetti & Co. S.p.A., France's Groupe Bull, Amdahl Corp., Netherlands-based Tulip Computers International, Unisys Corp., Sun Microsystems, Inc., NCR Corp. and UK-based Apricot Computers PLC. Sage, the alternative lobby representing 80% of the computer industry and led by IBM and Digital Equipment Corp., had no immediate comment on the council's discussions.

Commission officials pointed out that lobbying efforts will remain intense, and during this month's meeting, 75% of the ministers indicated that they had been contacted by lobbyists. In response to criticisms about the ardent efforts, one lobbyist explained, "What do they expect — they are on the verge of ruining European industry, and they expect us to keep quiet about it?"

Regarding maintenance, in an amendment presented to the council, the UK had argued that no derogation should be authorized, but following the meeting, Redwood said the UK would accept the replacement of the term "maintenance" with "correction of error." However, other member states, including France and Greece, said that such a definition was too restrictive.

Following consultation with its manufacturers, Germany is also expected to argue that the text must recognize a broader definition, industry sources explained.

On competing programs, Redwood said there was an evolving consensus that competing programs would not be permitted. Industry sources revealed that France, Greece and possibly Germany have found this too restrictive.

Left to the courts

Whatever the final outcome, Redwood said no text will eliminate all uncertainties, and "it will be left to the courts to determine the limits to reverse engineering." Although commission officials admitted that no text can eliminate all uncertainties, they insisted that the final text "will detail all the major parameters" by which derogations to copyright protection will be authorized.

Regarding the question of copyright duration, the commission has agreed to redraft the text to allow Germany to maintain its 70-year protection from the death of the author "until EC copyright rules are harmonized," a commission official explained. He pointed out that since most people will not buy even a 10-year-old program, the commission and other member states agreed to go along with what is perceived as a largely theoretical German reserve — at least for now.

Regarding rental rights, the official explained that both the Dutch and the German governments have accepted the commission's view that these rights must be exclusive. This means that only the original author can rent out his copyrighted program in addition to selling it. In other words, any firm that licenses the copyright cannot turn around and rent it to someone else.

De Bony is a Brussels-based correspondent at the IDG News Service.

HP attempts to meet Apollo OSF1 migration request

BY J. A. SAVAGE
CW STAFF

Hewlett-Packard Co. recently unveiled its plans to migrate workstation and Unix-based minicomputer users to the Open Software Foundation's (OSF) OSF1 operating system late last month, but HP's path is not what its Apollo division users had requested.

The first upgrades to OSF1 will be available to users who upgrade or buy computers with the merged HP and Apollo reduced instruction set computing (RISC) chip. Both the new computers and OSF1 are expected to be out in the first quarter of 1991, according to Jan Silverman, marketing manager for system software at Apollo.

Next in line will be Apollo Series 400 users who upgrade to workstations based on Motorola, Inc.'s 68040 processor. Those products are expected in mid-1992, Silverman said.

At the same time, Apollo users of the DN 10000 series with a 68040 upgrade will be able to use OSF1. Eventually, OSF1 will be available on multiprocessor products, and some of its features will be available on HP's proprietary operating system, MPE.

At the annual Apollo users group meeting early last month, users lobbied the company to allow them to migrate to OSF1 across the entire Apollo product line and not just at the high end. Recently, HP responded that users would have to upgrade their systems to run on a Motorola 68040-based processor before they can migrate to OSF1.

OSF1 is a version of the Unix operating system on which HP, among other vendors, has agreed to standardize. HP's version is set for release in 1992.

"They are starting to make some movement, but it's just one step," said Doug Eltoft, president of the users group. He added that while users always want "the biggest muscle car on the block" and will probably be initially upset that they cannot have it, "when they see OSF1 in the cold light of day, they probably won't be so eager to migrate, because it will take so much extra effort to port software."

To enable users from each architecture to migrate to the merged products, Glenn Osaka, open systems software planning manager at HP, said components of both the Apollo version and the HP version of the Unix operating system will coexist on OSF1. He added that all versions will have the same application programming interface to allow software portability.

"The last people to move will be the precision architecture multiprocessor users at the high end," Osaka said. He predicted that that version of OSF1 will be available "nine or 10 months" after the one for merged RISC.

Silverman said HP had not yet decided which functions, such as the Motif graphical user interface, to bundle with the new operating systems and which ones will be offered at a premium.

After moving all its Unix-based systems to OSF1, HP plans to offer some of OSF1's standards on its MPE proprietary operating system. "We're targeting to create as much software portable interfaces as possible," Osaka said. He added that it will probably include Posix, Motif and components of a distributed computing environment.

STORAGE MANAGEMENT

SOLUTIONS TODAY. AND TOMORROW.

A growing business mandates more applications and more data to be stored and managed. How will your resources meet this challenge?

With automated storage management products from Sterling Software—solutions that give you immediate functionality and future flexibility.

Sterling Software provides industry standards for file management, volume and data set allocation, and data compression. And our integrated workstation system, Storage Automation Management Systems (SAMS), reliably automates all your critical storage functions. Fully compatible with IBM's system managed storage strategy (DFSMS), SAMS provides a well-defined bridge to the future—and enterprise-wide system managed storage.

Put Sterling Software to work managing your storage requirements. It's the easy solution for today. And tomorrow. Sterling Software, Systems Software Marketing Division, 11050 White Rock Road, #100, Rancho Cordova, CA 95670. (916) 635-5535.

STERLING SOFTWARE

THE FUTURE IS STERLING.

Sterling Software, Systems Software Marketing Division, 11050 White Rock Road, #100, Rancho Cordova, CA 95670. (916) 635-5535.

Gupta update passes muster

BY JIM NASH
CW STAFF

Beta-test users of Gupta Technologies, Inc.'s SQL Windows Version 2.0 said the product's enhancements have filled some of the gaps they perceived in an earlier version.

Menlo, Calif.-based Gupta announced that it will ship Version 2.0 of the product with its SQLbase Server Version 4.1 on Nov. 30.

Eric Bloom, program manager at Dun & Bradstreet Software, said Gupta "filled a gaping hole in its Windows product" by folding a symbolic debugger into it. The debugger "lets me step through Gupta proprietary code a line at a time to . . . spot bugs in our own programs." He said the capability has been standard in C language compilers.

The line-by-line code inspection feature gives developers more control, said Steve Hlavacek, technical manager at Arthur Andersen & Co.'s Advanced Computer Audit Techniques Group in Chicago.

However, Bloom said, he would like to see Gupta move closer to Unix with both its SQL and server lines. "I would like to take what I have developed and port it to a Sun workstation."

SQL Windows Version 2.0 will be priced at $1,295. Those who bought Version 1.3 after Oct. 1 will receive the new version free. The OS/2 version of SQLbase Server Version 4.1 will cost $2,495, and DOS versions will be $1,995.

PC buyers test new channels

BY RICHARD PASTORE
CW STAFF

As the economic vise tightens and margin pressures mount in the personal computer dealer channel, many corporate PC buyers are reconsidering their source of supply. Buyers are shifting a significant share of unit purchases to other channels, including superstore and mail order, observers indicated.

The shift away from PC dealers is expected to equal 9% of units purchased over the next four years, according to Doug Kass, senior analyst at Dataquest, Inc. in San Jose, Calif.

This movement could spell further trouble for traditional storefront dealers such as Businessland, Inc., which earlier this month recorded its fourth consecutive quarterly loss.

The biggest motivators for channel-changing are better price and availability, according to observers.

"The superstores offer good pricing and inventory to the corporate customer," said Ty Hendricks, purchasing agent at Hughes Training Systems, a division of Hughes Aircraft Co. in Arlington, Texas. Hendricks said superstore chain Soft Warehouse, Inc. consistently underprices other bidders by 5% to 10%.

The cost issue made Steve Price a repeat customer of mail-order vendor Compuadd Corp. "For what you get, Compuadd has the best price," said Price, a technical analyst at steel fabricator FMC Corp. in Anniston, Ala.

Longtime IBM and Compaq Computer Corp. loyalist Corporate Health Strategies recently made its first purchase through the mail from Dell Computer Corp.

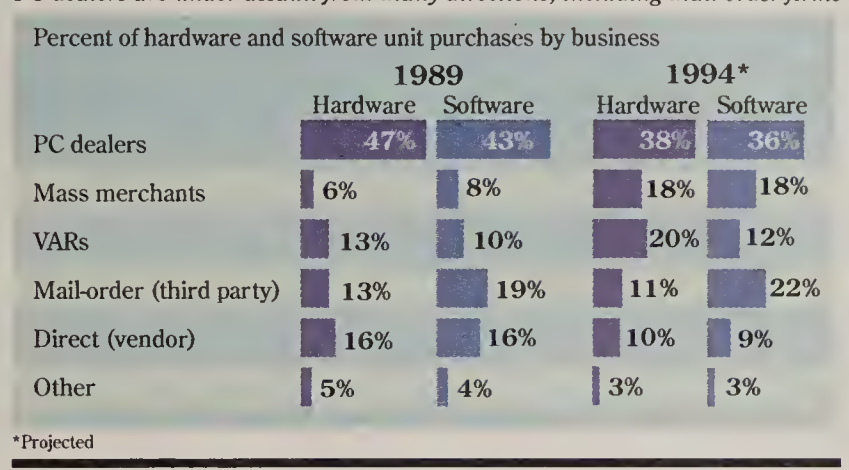
"We've been considering [mail order] for a while, but we were afraid to make the move" because of support concerns, said Bob Jahreis, assistant vice president of development at the Westport, Conn., firm.

Finally, price won out, and

Continued on page 52

Cleaning out the shelves

PC dealers are under assault from many directions, including mail-order firms



*Projected

Source: Dataquest, Inc.

CW Chart : Doreen St. John

Wang offers 'nontechie' expert system

BY SALLY CUSACK
CW STAFF

LOWELL, Mass. — Elbowing its way into the world of expert-based systems, Wang Laboratories, Inc. released a decision support tool designed specifically for "nontechies" using IBM Personal Computer ATs and compatibles and Micro Channel Architecture-based platforms.

Dubbed Commonknowledge, it allows users to create, distribute and maintain decision-making and/or problem-solving applications within a work group or companywide.

According to George Watters, principal at Watters and Associates, a software consulting firm in Spokane, Wash., the product employs a Socratic methodology in helping to clarify parameters in applications and overall goals.

Watters, who has worked with the program since its alpha-test days, has used the software to develop knowledge bases to help the Social Security Administration determine disability issues and has created several psychological testing and matching programs for job placement firms.

Using a conversational method, Commonknowledge assists the application developer in organizing the knowledge and building a complete knowledge base. In turn, the user running the subsequent application is asked for information as needed to solve the problem. The user may also ask why the information is needed or how the solution was reached.

Transparent logic

"The logic is transparent to end users," Watters said. "It has a close relationship to word processing — a developer has simply to block the text and build the technology."

Watters runs the software on Intel Corp. 80386-based machines. The software requires 2M bytes of extended memory on the 386-based systems and hard disk storage capacity, the vendor said.

Applications built with Commonknowledge can be integrated with MS-DOS files as well as with a variety of standard image files, including Tag Image File Format and Wang Image File Format. Applications can also be integrated with user-written subroutines.

Commonknowledge is available in two packages. One package includes both runtime and development components and is priced at $950. A runtime-only version is priced at $150 per user or $750 for a site license.

CICS OS/2 Programming Is Now as Easy as:

>A:SETUP

MICRO FOCUS®
A Better Way of Programming™

You can now get IBM CICS OS/2 as an optional add-on to the Micro Focus COBOL/2 Workbench™!

Here is what's included in the CICS OS/2 Option:

- *IBM CICS OS/2 on Diskette Media*
- *SETUP Procedure*
- *BMS Screen Development Facility*
- *Integrated Preprocessor*
- *Online Help*

♦ CICS programmers can now get Micro Focus COBOL/2 Workbench and the powerful inter-systems communications of IBM CICS OS/2 to create and test new "cooperative processing" applications. You can process CICS transactions on local workstations and access databases on a CICS host or on networked CICS OS/2 systems.

♦ The Micro Focus SETUP procedure installs the CICS OS/2 Option on your programming workstation within 30 minutes! This makes CICS OS/2 accessible from the Micro Focus menu system. There is no need to do an initial install on the host.

♦ The integrated preprocessor in the CICS OS/2 Option allows programmers to debug at the EXEC level and view original source code instead of expanded precompiled code.

♦ The BMS screen development facility can design and paint CICS transaction screens or import BMS mapsets.

♦ Micro Focus Advanced ANIMATOR™ lets CICS programmers create program structure charts, monitor multiple data variables, analyze source code execution, or alter the flow of control. Workbench has all the tools you'll want for debugging and testing sophisticated online transaction applications.

♦ IBM CICS OS/2 lets your workstation based CICS applications talk to mainframe data files and databases transparently. Build and test these applications with the CICS OS/2 Option and take full advantage of the transaction routing and function shipping features to reduce host and network loads.

Let your applications reside where your business needs them! Develop and test cooperative processing applications with the CICS OS/2 Option for Micro Focus COBOL/2 Workbench.

For more information about the CICS OS/2 Option call Micro Focus today at 1-800-872-6265 or 415-856-4161.

IBM and CICS OS/2 are trademarks of International Business Machines Corporation.

Compaq introduces an 8½"×11" awesome display of power.

One look at our powerful new notebook PC, and you'll see why more FORTUNE 1000 companies choose COMPAQ portables and laptops over all others.* Now see it in person at your Authorized COMPAQ Computer Dealer.
Call 1-800-231-0900, Operator 138 for the location nearest you.
In Canada, 1-800-263-5868, Operator 138.

COMPAQ

It simply works better.

ACTUAL SIZE

YOU'RE LOOKING AT THE NEW COMPAQ LTE 386s/20 PERSONAL COMPUTER.
THE MOST POWERFUL NOTEBOOK PC ON THE PLANET.

■ YES, IT'S SMALL, BUT LOOK HOW BIG IT IS ON THE INSIDE.

■ VGA DISPLAYS RAZOR-SHARP GRAPHICS IN 16 GRAY SHADES.

■ THE 20-MHz INTEL 386SX PROCESSOR WITH CACHE SETS YOUR PRODUCTIVITY ON FIRE.

■ STORES UP TO 30,000 PAGES. THE ONLY NOTEBOOK PC THAT OFFERS A 60-MB FIXED DISK DRIVE.

■ AT A MERE 7.5 LB. WITH BATTERY, IT TRAVELS LIGHT.

■ THE 2-MB HIGH-SPEED RAM IS EXPANDABLE TO 10 MB.

■ MORE THAN 3 HOURS' BATTERY LIFE PLUS INTERNAL FAST CHARGE.

■ ADD A DESKTOP EXPANSION BASE FOR MORE OFFICE CAPABILITY.

■ TRAVEL MUCH? OUR WORLDWIDE WARRANTY ASSURES SERVICE IN OVER 60 COUNTRIES.

■ YOU CAN EVEN PLUG IN A MOUSE.

*Based on a Gallup Organization poll conducted for Computer Reseller News Benchmark Magazine. COMPAQ, Registered U.S. Patent and Trademark Office. Product names mentioned herein may be trademarks and/or registered trademarks of other companies. © 1990 Compaq Computer Corporation. All rights reserved.

...icrocomputers.

Many industry observers still see OS/2, with its inherent multitasking functionality, as the eventual PC standard. F... ...ing appeal

Computer Systems News, May 28, 1990

"Eventually" is here.

Announcing The OS/2 You've Been Waiting For.

For quite some time, the press has been writing about the move everyone will want to make to OS/2.® Eventually.

Well, all at once OS/2 1.3 has made OS/2 the operating system it was meant to be—the one you'll want to move to right here and now.

OS/2 Loses A Little Weight.

For starters, OS/2 has lost some of its appetite for memory. In fact, now you can make the move to OS/2 1.3 with as little as two megabytes on

...user ... to choose ... OS/2 Presentation Manager will be the strategic environment that will carry PC users into the next century. S... ...has ma... ...ed...

PC Magazine, September 11, 1990

your system. What's more, this streamlined version leaves more room for applications and will offer some users a substantial performance increase in many system functions.

Functionality. Functionality. And Did We Mention Functionality?

Multitasking. Seamless connectivity. The ability to run applications larger than 640K. DOS® compatibility. All these features have made OS/2 appealing in the past, but new features have catapulted OS/2 into the here and now.

For instance, now OS/2 1.3 harnesses the power of Adobe Type Manager™ (ATM™).

...den in design... ...complex applications ... OS/2. OS/2 will become a more attractive option for the future as users learn to take better advantage of its multitasking, enhanced de-

PC Week, August 13, 1990

With this new feature, the quality of screen fonts has improved dramatically, giving you a true WYSIWYG capability so what you see is indeed what you get. ATM also gives OS/2 more flexibility in document creation by supporting a wide range of outline fonts.

Of course, what good is all this without printer support? Not much. So OS/2 1.3 has improved and expanded its printer support to include drivers for almost all popular printers.

Business Is Booming.

Now that OS/2 is moving forward, so are software developers. Every day, more and more applications are joining the growing pool of available OS/2 software. In fact, a variety of major business programs, including Aldus® PageMaker,® Lotus® 1-2-3/G® and Microsoft® Excel, have already made the transition to OS/2.

These, along with many others, have been redesigned to go beyond DOS memory limits and take advantage of OS/2's intuitive graphical interface—Presentation Manager.™

It's been said that eventually

...give up a thing to do it. Eventually, we need OS/2 ... all the power and safety the ...ating system brings.

Will Fastie, *The Fastie Report*, May 31, 1990

you'll want to take advantage of everything OS/2 has to offer. Well, wait no more because "eventually" is here.

For more information on what OS/2 can do for you here and now, or to get details on a no-charge upgrade to Version 1.3, contact your IBM Authorized Remarketer or marketing representative.

OS/2 can do!

IBM

IBM and OS/2 are registered trademarks and Presentation Manager is a trademark of International Business Machines Corporation, Microsoft and DOS, registered trademarks of Microsoft Corp., Adobe Type Manager and ATM, trademarks of Adobe Systems, Inc. Aldus and Pagemaker registered trademarks of Aldus Corp., Lotus and 1-2-3/G, registered trademarks of Lotus Development Corp. (c)1990 IBM Corp.

COMMENTARY

James Daly

Is the pen mightier?

Whoever said silence is golden certainly wasn't trying to make a buck in the computer industry, where those making the loudest noise often have the least to say.

Nowhere is that unfortunate trait more sharply evident — and nowhere is the potential negative user backlash greater — than in the fledgling area of pen-based computing. This nifty little technological wrinkle uses a stylus instead of a keyboard to enter data.

In the handful of years since the concept has been publicly trumpeted, everyone — from billion-dollar leviathans such as Microsoft to basement start-ups — has said they're building products that can recognize handwriting.

The repercussions of such an advance could be staggering. Everyone from police officers reporting an accident scene to store clerks taking inventory could quickly and easily enter data into a computer, thus greatly streamlining productivity. Naturally, there would also be a king's ransom for the company that first made a name for itself in this market.

As a result, a heated game of verbal one-upmanship has developed among many of the players in the embryonic market, particularly the smaller ones that are not yet household names. It doesn't matter that only three companies — Grid

Continued on page 57

Optical option yields savings

BY RICHARD PASTORE
CW STAFF

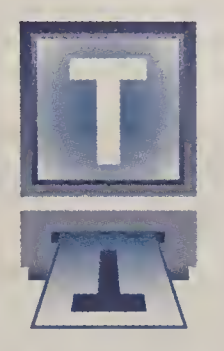
A do-it-yourself alternative provided by an optical disc-based personal computer application is saving some small and medium-size banks at least $2,000 per month in archiving charges.

Many smaller financial institutions pay outside service bureaus to process and summarize daily banking transactions. After receiving and crunching the numbers, these bureaus transmit the data to the banks' PCs, which are then tied up for hours printing the reports. For an extra charge, the banks also receive microfiche archive copies of the data.

Some early user banks have sought to save time and reduce charges with an optical disc-based information management system announced last month by Ceisar Systems, Inc. in Franklin, Mass.

The application takes data from the bank's minicomputer, service bureau or direct input via PC keyboard or scanner and stores it on optical disc for retrieval, analysis or archiving.

Once data is on optical disc, the software's retrieval utilities allow users to access only the parts they want and print only the reports they need. Managers can also duplicate the optical discs for off-site storage.



Users who have tested Ceisar Plus for the past six months said these features have eliminated the cost and clutter of microfiche, cut down on paper use and saved time.

"It has replaced our fiche for archive purposes and eliminated a cost of roughly $2,000 per month," said Larry Hartwell, a comptroller at Kennebunk Savings Bank in Kennebunk, Maine. The bank has $175 million in assets.

Hartwell estimated the system, which costs from $18,000 to $25,000, will pay for itself from microfiche savings alone in less than 12 months. "It's really easy to make those types of investments when you have paybacks like that," Hartwell said.

The Brockton Credit Union in Brockton, Mass., expects a payback in 15 months and has reduced its report-paper use by 75%, comptroller Albert Antinellis said.

"We used to print everything that came down [from the service bureau]," Antinellis said. "With the optical disc, we're able to print only what we want."

Once the data is on optical disc, most users simply pull up what they want and view it on-screen, Antinellis noted. This was not easily done before because of the format in which the bureau downloaded the data.

Although optical discs do not come cheap, their million-page capacities make up for the relatively high cost of the medium, users said.

Ceisar Plus' ability to operate on a local-area network gives banks the added flexibility of supporting multiple simultaneous users. Previously, bank employees wanting to check a transaction had to retain a paper report or fetch the single copy of the microfiche. "Then you could only have one user at a time," Hartwell said.

But this week, Hartwell will incorporate the optical system into a 15-user network. "Now they don't have to leave their work area, and you can have multiple inquiries at the same time," Hartwell said.

Early users reported few problems with the application, which they bought directly from the vendor. "It was one of the first [such applications] out there working and working well," Antinellis said.

The Ceisar system operates on IBM Personal Computers and compatibles and comes with a write-once read-many optical drive. Optional packages add a PC, printer, desktop scanner and network interface.

Big little PC group hatches memory plan

ANALYSIS

BY MICHAEL FITZGERALD
CW STAFF

There is a secret association brewing up big things for the computer industry.

Well, not exactly. But the Personal Computer Memory Card Industry Association (PCMCIA) just might be the biggest little association nobody has heard of.

The PCMCIA's membership list reads like the Who's Who of microcomputing, with 82 companies ranging from IBM to Microsoft Corp. The PCMCIA was formed in June 1988 to develop a standard interface for flash memory cards.

For what, you ask? Flash memory, an integrated circuit about the size of a credit card that could well replace traditional read-only memory and random-access memory.

"It's embryonic now, but I expect that in five years everyone will know what a memory card is," predicted John Riemer, director of marketing at Fujitsu International and chairman of the PCMCIA.

However, there are almost no users, and the only true commercial application for memory cards at the moment is in Poqet Computer Corp.'s Poqet computer, as well as some scattered embedded controllers in specialized industries. So why all the interest?

"We see it emerging as a key technology," said Yogi Singh, manager of system design and analysis at IBM's Entry Systems Division. Other vendors, ranging from Lotus Development Corp. to Polaroid Corp., agreed with IBM.

They said the reason they expect so much from the memory card is its nature. Memory cards are small, lightweight, durable and have no moving parts, which means they use almost no power. This makes them very attractive to makers of portable computers who are searching for ways to improve power use and reduce machine weight.

"It's a significant improvement [over floppy disks]," Singh said.

Despite the number of members, some of which traditionally have not agreed on much of anything — like Lotus and Microsoft — the PCMCIA was able to develop a software standard quite quickly. The standard was

Continued on page 48

Prefer a TSO-style editor? Try a Free DOS or OS/2 demo!

SPF/PC® *and* **SPF/2™**

Whether you're working in DOS or OS/2, we've got an editor to meet your needs. And, we've got a deal for you — a free, real-working-code demonstration diskette that faithfully recreates the ISPF/PDF environment and does everything except SAVE your work to disk.

In DOS, **SPF/PC** has been providing MVS and COBOL programmers with that same familiar environment for more than six years.

SPF/PC was the first PC editor to bring large-file editing to the PC. With it's virtual addressing feature, **SPF/PC** allows you to edit files as large as the free work space on your hard drive, extended or expanded memory. **SPF/PC** also provides you with:

- ❒ directory lists
- ❒ Command stacking
- ❒ Binary editing
- ❒ 43-line EGA support
- ❒ True split screen
- ❒ Picture strings
- ❒ Hexadecimal editing
- ❒ 50-line VGA support

In OS/2, **SPF/2** provides an even more seamless migration from mainframe to PC, keystroke for keystroke, with true mainframe compatibility, superior PC-processing speed, macros and 3270 emulation.

SPF/2 makes it possible to pull your applications together with its interface to IBM's SAA "glue language," REXX. And, if you already have REXX edit macros on your mainframe, you can download these to the PC to run with **SPF/2**.

For **SPF/2**, there's a new, cost-effective, Multi-User License for purchase from CTC only. For information, call the contract administrator at (800) 336-3320.

Try **SPF/PC** and **SPF/2** for yourself. A free demo is yours for the asking! Just call the toll-free, 24-hour Demo Request Hot Line at **(800) 648-6700** and mention you saw this offer in the Nov. 5 *Computerworld*.

CTC® Command Technology Corporation

1040 Marina Village Parkway, Alameda, CA 94501
Telephones: (415) 521-5900 (800) 336-3320
Telefax: (415) 521-0369 *Telex* 509330 CTC

In a hurry? Call the Demo Request Hot Line at (800) 648-6700.

IBM releases Storyboard Live to match multimedia promises

BY PATRICIA KEEFE
CW STAFF

WHITE PLAINS, N.Y. — With the recent release of Storyboard Live, IBM delivered an enhanced version of its 6-year-old desktop multimedia software for low-end DOS-based systems just as multimedia developers are beginning to fulfill promises.

The $495 package reflects efforts by industry leaders such as IBM and Microsoft Corp. to bring multimedia to users at minimal cost. Next week, the two will be joined by Tandy Corp., Zenith Data Systems and Fujitsu Ltd. at a press conference to introduce multimedia extensions to Windows 3.0 and pitch a low-end hardware platform as a standard [CW, Nov. 12].

However, only certain modules of Storyboard Live will run as full-screen Windows applications. It does not exploit Windows conventions, said Jay Sherry, manager of graphics products at IBM's Desktop Software in Milford, Conn.

Storyboard Live is said to allow users to create on-screen presentations that incorporate drawing, painting, animation, motion video and voice on entry-level machines. IBM defines that hardware as an IBM Personal Computer XT with 640K bytes of random-access memory. "It does all this with 640K and no extended memory. It's a technological tour de force," Sherry said. Storyboard Live uses 512K bytes of RAM.

IBM's Storyboard Live *provides an electronic presentation module that allows automatic frame sequencing*

The electronic presentation feature contains background templates and automatic frame-sequencing capabilities. There are 34 sprites, or canned animation routines; a video editor; Realsound Corp.'s Realsound technology; and support for key file and image formats and IBM's Linkway, OS/2 and Audio Visual Connection (AVC).

Users can also play back AM-quality video without adding hardware, enabling them to distribute Storyboard Live presentations on disks. Black and white presentations can be viewed at 20 to 25 frame/sec.; color video is viewed at 12 to 15 frame/sec.

"What [an] author's on-screen presentation really needs is the ability to reproduce stories on diskette for distribution and know they will be able to be played on mass-market PCs," Sherry said.

The new release also supports IBM's M-Motion Video Adapter/A and will exchange files with Version 1.03 of IBM's AVC software announced at the recent unveiling of the OS/2 Models 90 and 95. Priced at $544, AVC Version 1.03 provides touch-screen capabilities for authoring and viewing multimedia presentations. Users can play back presentations on a videocassette recorder or television. Other improvements include:

- Audio — Higher fidelity sound and the abilty to play Musical Instrument Digital Interface.
- Imaging — Allows airbrushing, tilting and 360-degree rotation.
- Authoring/Runtime — Simplifies authoring and retrieves a variety of drawings from other applications.

Memory plan

CONTINUED FROM PAGE 47

announced Aug. 22, 1990.

It did not hurt that a hardware standard for memory cards already existed. The Japanese Electronic Industry Developers Association (JEIDA) adopted a 68-pin interface in 1988. Once the PCMCIA was formed, it moved over to adopt the 68-pin interface for software.

"It was an unprecedented cooperation with JEIDA, between Japanese and American groups," Reimer said. Having the standard could speed product development — memory card technology is not new — but prior to the announcements, there were 10 vendors making them.

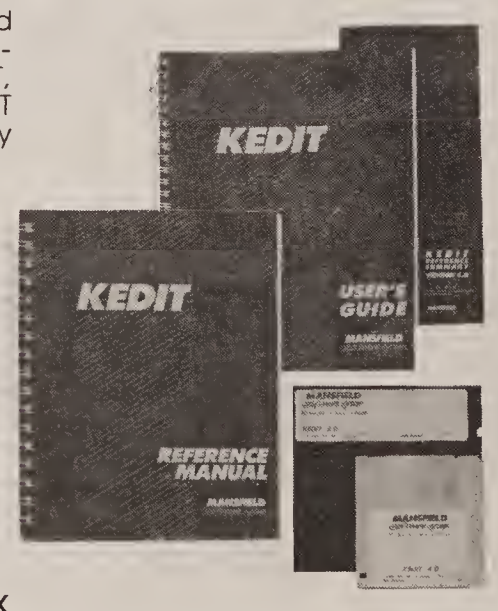
Even with the standard, memory cards are not cheap and will not be until the market comes down. Intel Corp. sells its 1M-byte flash memory cards at $298 each. The largest card on the market contains 4M bytes.

"It's an emerging technology, and still too expensive for consumers, but in a year or two, pricing will be down enough to see all kinds of mass market users," said Daniel Sternglass, president of Databook Technologies, Inc. in Princeton, N.J. Databook displayed its own disk drive for memory cards at last week's Comdex/Fall '90 show in Las Vegas.

Reimer said he expects the cards will find a wide use outside of the personal computer market. Sternglass offered this example of a possible use: "You'll be able to plug one of these cards into the [Associated Press] news file in a train station, download the sports and read it on the train," he said.

KEDIT 4.0
XEDIT COMPATIBLE PC EDITOR

KEDIT™ is a text editor for DOS and OS/2 that supports most commands and features of XEDIT, IBM's editor for VM/CMS. But KEDIT goes beyond XEDIT compatibility with special PC-based features for a first-rate combination of mainframe power and PC flexibility.



- More than 100 XEDIT compatible commands and SET options, including the ALL command.
- XEDIT prefix commands, targets, and fullscreen layout.
- Multiple files, multiple windows.
- Built-in subset of the REXX macro language included.
- Interfaces to Personal REXX and IBM's OS/2 REXX.
- Enhanced block operations.
- And much, much more.

"While KEDIT remains true to its heritage in retaining compatibility with the mainframe XEDIT, it is also one of the most feature-packed PC text editors around."
PC Magazine, 10/31/88

MANSFIELD Software Group
P.O. Box 532, Storrs CT 06268
(203) 429-8402

DOS Version: $150.
OS/2 Version: $175.
(includes DOS version)
Shipping: $3.
Demo version available.

KEDIT is a trademark of the Mansfield Software Group, Inc.

Seagate offers line of hard disks to laptop, supercomputer markets

BY MAURA J. HARRINGTON
CW STAFF

SCOTTS VALLEY, Calif. — Seagate Technology, Inc., a disk drive manufacturer here, recently filled out its product lines on both the high and low ends with a slew of new hard disk drive introductions designed for computers ranging from notebook-size laptops to Cray Research, Inc. supercomputers.

In the gigabyte arena, the company introduced two 8-in. disk drives with data transfer rates of almost 10M byte/sec., the company said. The Sabre ST83050 and the ST83220 use Seagate's Head Disc Assembly design, which conforms to the ANSI Enhanced Intelligent Peripheral Interface, the company said.

Also on the high end, Seagate unveiled a 2.3G-byte disk drive, designed with a data transfer rate of up to 27M byte/sec., according to the company.

This drive, called the Sabre Parallel Transfer Disc (PTD), was codeveloped with supercomputer company Cray Research, which said it will incorporate its proprietary version of the drive into its new supercomputer, the Y-MP2E, which will be designed for high-end processing for markets such as high-performance computing, graphics, imaging, animation, broadcast video and data acquisition.

The Sabre PTD drive uses nine read-write heads simultaneously and has an average seek time of about 12 msec, the company said. It also conforms to the ANSI Enhanced Intelligent Peripheral Interface specification, which calls for the use of a single cable to simplify systems integration, according to Seagate.

In the 5¼-in. high-end market, the firm introduced its Elite 1.6G-byte drive family, including two full-height small computer systems interface drives, one with a dual-ported interface that allows two computer systems to share access to common disk drives, the firm said.

Saving on rotation

Seagate also recently introduced a high-end drive for multiprocessing and other systems that require data sharing or multiple access to data. The Seagate ST8167 incorporates Solid State Disc technology instead of rotating disks and is designed to give users access to their data up to 100 times faster than standard rotating disk drives, the company said.

On the personal computer front, Seagate introduced a low-power consumption, 107M-byte formatted 3½-in. disk drive with an average seek time of 18 msec and an internal data transfer rate of up to 12M byte/sec.

Designed for the laptop personal computer market, the ST3120A was made using Seagate's patented Zone Bit Recording technology, which is designed to maximize disk capacity by recording more bytes on a drive's outer tracks, resulting in a faster I/O rate.

YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $38.95* per year — a savings of 62% off the single copy price.

First Name MI Last Name

Title Company

Address

City State Zip

Address Shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: $48 per year

* U.S. Only. Canada $110, Central/South America $130, Europe $195, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1. **BUSINESS/INDUSTRY** (Circle one)
   - 10. Manufacturer (other than computer)
   - 20. Finance/Insurance/Real Estate
   - 30. Medicine/Law/Education
   - 40. Wholesale/Retail/Trade
   - 50. Business Service (except DP)
   - 60. Government - State/Federal/Local
   - 65. Communicetions Systems/Public Utilities/ Transportation
   - 70. Mining/Construction/Petroleum/Refining/Agric.
   - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   - 85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
   - 90. Computer/Peripheral Dealer/Distr./Retailer
   - 75. User: Other _____
   - 95. Vendor: Other _____ (Please specify)
2. **TITLE/FUNCTION** (Circle one)
   IS/MIS/DP MANAGEMENT
   - 19. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
   - 21. Dir./Mgr. MIS Services, Information Center
   - 22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; Dir./Mgr. PC Resources
   - 23. Dir./Mgr. Sys. Development, Sys. Architecture
   - 31. Mgrs., Suprv. of Programming, Software Dev.
   - 32. Programmers, Software Developers
   - 60. Sys. Integrators/VARs/Consulting Mgt.

   OTHER COMPANY MANAGEMENT
   - 11. President, Owner/Partner, General Mgr.
   - 12. Vice President, Asst. VP
   - 13. Treasurer, Controller, Financial Officer
   - 41. Engineering, Scientific, R&D, Tech. Mgt.
   - 51. Sales & Mktg. Management

   OTHER PROFESSIONALS
   - 70. Medical, Legal, Accounting Mgt.
   - 80. Educator, Journalists, Librarians, Students
   - 90. Others _____ (Please specify)
3. **COMPUTER INVOLVEMENT** (Circle all that apply)
   Types of equipment with which you are personally involved either as a user, vendor, or consultant.
   - A. Mainframes/Superminis
   - B. Minicomputers/Small Business Computers
   - C. Microcomputers/Desktops
   - D. Communications Systems
   - E. Local Area Networks
   - F. No Computer Involvement

E4047F-2

YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $38.95* per year — a savings of 62% off the single copy price.

First Name MI Last Name

Title Company

Address

City State Zip

Address Shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: $48 per year

* U.S. Only. Canada $110, Central/South America $130, Europe $195, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1. **BUSINESS/INDUSTRY** (Circle one)
   - 10. Manufacturer (other than computer)
   - 20. Finance/Insurance/Real Estate
   - 30. Medicine/Law/Education
   - 40. Wholesale/Retail/Trade
   - 50. Business Service (except DP)
   - 60. Government - State/Federal/Local
   - 65. Communications Systems/Public Utilities/ Transportation
   - 70. Mining/Construction/Petroleum/Refining/Agric.
   - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   - 85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
   - 90. Computer/Peripheral Dealer/Distr./Retailer
   - 75. User: Other _____
   - 95. Vendor: Other _____ (Please specify)
2. **TITLE/FUNCTION** (Circle one)
   IS/MIS/DP MANAGEMENT
   - 19. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
   - 21. Dir./Mgr. MIS Services, Information Center
   - 22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; Dir./Mgr. PC Resources
   - 23. Dir./Mgr. Sys. Development, Sys. Architecture
   - 31. Mgrs., Suprv. of Programming, Software Dev.
   - 32. Programmers, Software Developers
   - 60. Sys. Integrators/VARs/Consulting Mgt.

   OTHER COMPANY MANAGEMENT
   - 11. President, Owner/Partner, General Mgr.
   - 12. Vice President, Asst. VP
   - 13. Treasurer, Controller, Financial Officer
   - 41. Engineering, Scientific, R&D, Tech. Mgt.
   - 51. Sales & Mktg. Management

   OTHER PROFESSIONALS
   - 70. Medical, Legal, Accounting Mgt.
   - 80. Educator, Journalists, Librarians, Students
   - 90. Others _____ (Please specify)
3. **COMPUTER INVOLVEMENT** (Circle all that apply)
   Types of equipment with which you are personally involved either as a user, vendor, or consultant.
   - A. Mainframes/Superminis
   - B. Minicomputers/Small Business Computers
   - C. Microcomputers/Desktops
   - D. Communications Systems
   - E. Local Area Networks
   - F. No Computer Involvement

E4047F-2

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

PC Tools: More than a shell for a minimal price

Technology Analysis is a roundup of expert opinions about new products. This week we examine the two leading DOS shells: PC Tools Deluxe 6.0 and Norton Commander 3.0. Summaries were compiled by Suzanne Weixel.

Even though it is categorized as a shell, Version 6.0 of Central Point Software, Inc.'s PC Tools Deluxe may be the most comprehensive package of DOS utilities available, reviewers at leading personal computer labs and publications.

The package includes utilities for system management, data recovery and protection, file viewing, desktop management, fax management and telecommunications. Users can also employ Version 6.0's applications menu to load one application while they are within a second one.

Such features have made PC Tools Deluxe popular with users: It holds 41% of the market share for DOS utilities, according to Dataquest, Inc. (Share includes all versions of the product.) Version 6.0 was introduced in March 1990.

Despite its size — it takes up almost 3M bytes of disk space and comes with nearly 1,000 pages of documentation — and depth of functionality, PC Tools Deluxe offers an intuitive, consistent interface that makes it easy to learn and use. It accepts commands from the keyboard or a mouse. The DOS command line is always on the screen.

In fact, everything is almost always on screen, which most reviewers call a mixed blessing. While it is easy to access the functions you want, the screen is so full that it may be hard to find them. To alleviate this problem, Version 6.0 provides variable user levels.

If you're looking for a complete utility package, PC Tools Deluxe is a good value at $149.

Central Point responds

Matthew Mosman, product manager:
The size is in no way a limitation. Every new feature adds value.

The documentation is organized so users can read only what they need. The technical support staff has been beefed up so that callers don't have to wait.

Product: PC Tools Deluxe 6.0

score: 81

Points	Category	Methodology*
23	Reviews	Average of available numeric scores from reviews multiplied by a factor of 3
16	Analysts	Average of 1-to-10 rating from three product analysts multiplied by a factor of 2
13	Users	Average of 1-to-10 rating from three major users multiplied by a factor of 1.5
15	Costs	Average of users' and analysts' ratings of cost to get product up and running multiplied by a factor of 2
14	Financials	Average of 1-to-10 rating from three analysts on health of company and product sales; factor: 1.5
81 *(Maximum score: 100)*		**The 1-to-10 scale: 1 equals poor, and 10 equals excellent. Maximum points per category: Reviews – 30; Analysts – 20; Users – 15; Costs – 20; Financials – 15*

Reviews Summary

Criteria	Infoworld 4/16/90	PC Magazine 6/12/90	PC World 7/90
Ease of use	Very good	Foirly eosy	Excellent
File manager	Very good	Terrific	Foir
File viewer	Very good	NC	Excellent
Documentation	Very good	Manual runs on a bit	NC
Technical support	Poor	NC	NC
Value	Excellent	NC	Excellent
Reviewer's score	7.5*	Editor's choice	Best buy

**Ratings are based on weighted scale of 1 to 10 where 10 is excellent. Only the* Infoworld *rating is included in score chart above. These are excerpts of the reviews. Refer to actual articles for details. NC: No comment*

Ratings

Product performance
- 600,000 copies of Version 6.0 sold.
- Ratings by selected users (product, cost): 8/8; 9/7; 9/10; analyst ratings: 9/10; 10/9; 5/7.5

Financial performance
- Company revenue: $30.4 million, first half of fiscal 1991
- Financial analyst ratings (company and product sales): 9; 8; 10

Commander: Strong viewer, but only a fair manager

Symantec responds

Alicia Thompson, product manager:
Our features address novices and experts. 3.0 has context-sensitive help.

File management is adequate for how it's used — making it easier to work, but not getting in the way.
The booklet gets the user working in 30 minutes.

Product: Norton Commander 3.0

score: 68

Points	Category	Methodology*
21	Reviews	Average of available numeric scores from reviews multiplied by a factor of 3
12	Analysts	Average of 1-to-10 rating from three product analysts multiplied by a factor of 2
12	Users	Average of 1-to-10 rating from three major users multiplied by a factor of 1.5
10	Costs	Average of users' and analysts' ratings of cost to get product up and running multiplied by a factor of 2
13	Financials	Average of 1-to-10 rating from three analysts on health of company and product sales; factor: 1.5
68 *(Maximum score: 100)*		**The 1-to-10 scale: 1 equals poor, and 10 equals excellent. Maximum points per category: Reviews – 30; Analysts – 20; Users – 15; Costs – 20; Financials – 15*

Reviews Summary

Criteria	Infoworld 4/16/90	PC Magazine 6/12/90	PC World 7/90
Ease of use	Very good	May confuse novices; variety for experts	Excellent
File manager	Good	Powerful and flexible	Fair
File viewer	Very good	Commander shines	Excellent
Documentation	Good	Manual is terrible	NC
Technical support	Very good	NC	NC
Value	Very good	NC	Good
Reviewer's score	7.0*	Powerful features	Best buy

**Ratings are based on weighted scale of 1 to 10 where 10 is excellent. Only the* Infoworld *rating is included in score chart above. These are excerpts of the reviews. Refer to actual articles for details. NC: No comment*

Ratings

Product performance
- Commander's installed base: 200,000
- User ratings (product features, cost): 8/5; 7/6; 10/2. Analyst ratings: 8/8; 4/5; 6/5

Financial performance
- Norton products represent 30% of Symantec's $110 million revenue
- Financial analysts ratings (company health and product sales): 8; 9; 9

Symantec Corp.'s Norton Commander 3.0 offers strong features, particularly at the interface level, making it a popular choice among the leading DOS shells. Commander works with the well-known Norton Utilities to make a complete operating system management package. Norton products provide 30% of Symantec's revenue. With 5% of the DOS utilities market, Norton Commander (all versions) is second in the shell category to PC Tools Deluxe.

Commander offers such niceties as the ability to display one or two directory tree or file listings, execute a file in a file listing or launch applications and load specific files. However, the lack of certain file management features and disk utilities is considered a drawback by most reviewers. For instance, Commander cannot deal with files from more than one directory at a time. It also cannot copy, delete or move an entire directory or wipe deleted files clean.

Though critical of the file manager, most reviewers praise Commander's interface for its logical, well-organized structure. It even supports extended Enhanced Graphics Adapter/Video Graphics Array (EGA/VGA) modes so users can see more files on the screen at once than in standard mode. Commands can be issued via point-and-shoot, pull-down menu selection, function keys, single-letter keys or the DOS command line. Novices may be confused by so many choices, says *PC Magazine*, but higher-level users will appreciate the flexibility. The program's file viewers and MCI Mail interface also impress reviewers.

In sum, reviewers say, Norton Commander is worth the $149 price for users with at least 256K-byte random-access memory and who want a reliable package that offers strong interface features to MCI Mail and other functions.

You won't get fire
You may, how

Introducing the NEC PowerMate® SX/20. If you want a system

that will make a noticeable impact on your company's productivity, it's worth a look, for a lot of reasons. The most important one being, it's from NEC.

Which means that not only does the PowerMate SX/20 give you advanced technology, excellent performance and uncompromised quality, it also offers you the security that your system will be fully supported in the years ahead by people who will be there when you need them.

Fact is, NEC Corporation is a 24-billion-dollar company. As well as the world's third largest manufacturer of personal computer systems.

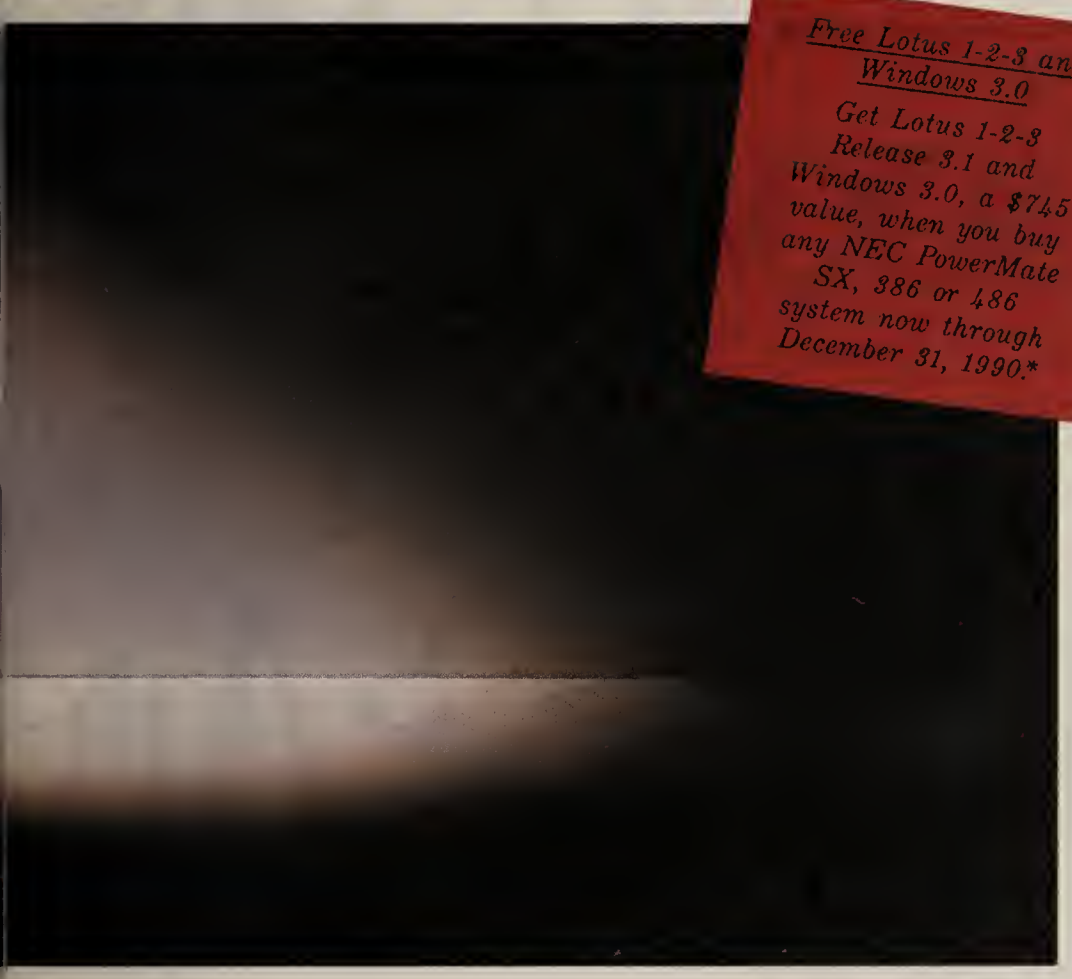
C&C
Computers and Communications

*Some restrictions may apply. Call 1-800-NEC-INFO to locate the authorized NEC reseller nearest you.

d for buying NEC.
ever, get noticed.

All of which helps to make a great system an even greater value.

Built around the 20MHz Intel® 386™SX microprocessor operating at zero wait states, the PowerMate SX/20 offers 2MB of standard



RAM, which is readily expandable to 16MB. It also gives you the storage bays and expansion slots you need to make your system grow as your needs do.

Best of all, it gives you something no one else can give you at any price: NEC. A company that knows the personal computer industry, inside and out.

PowerMate is a registered trademark of NEC Corporation

For additional information, call 1-800-NEC-INFO.

386 is a trademark of Intel Corporation

The PowerMate SX/20. Choosing it will gain you a certain amount of attention. All of it good.

Intel is a registered trademark of Intel Corporation

©1990 NEC Technologies Inc

NEC

PC buyers

FROM PAGE 43

Jahreis approved a server purchase from Dell at half the cost of a Compaq machine. Dell also offered a better delivery time than the local Compaq dealer, he added.

While many corporate buyers still doubt the support capabilities of alternative channels, some vendors are gaining word-of-mouth accolades. In a Dataquest survey released late last month, U.S. businesses rated two mail-order firms among the top three PC vendors in more than all customer satisfaction.

In the survey of nearly 5,000 users, Dell and Compuadd outscored the likes of Compaq, IBM and Apple Computer, Inc. in quality, value/price, product features, delivery, documentation and commitment to customers.

Cheaper channels

Companies that handle their own support are also increasingly opting for the cheaper channels rather than paying extra for services they do not need.

"We have on-site expertise that I'll put up against any local store's tech support," said Terry Bryan, special project manager at Hudson Foods, Inc. in Rogers, Ark. Bryan has switched all of his business to mail order.

James Montgomery, vice president of Reliance Insurance Co. in Philadelphia, rejected the notion of mail order as recently as eight months ago, steadfastly insisting on the advantages of face-to-face supplier/customer contact. However, those advantages are gone now, he said, and he and other buyers like him are defecting to mail order.

"There was a general deterioration in the quality of the service from the dealers," Montgomery said. Warrantied maintenance became slipshod. Shipments arrived incomplete.

Businessland Chief Executive Officer David Norman, announcing his firm's quarterly earnings earlier this month, claimed he was not losing share to alternative channels.

The superstores "are focusing on a different segment. I don't see them in the corporate Fortune 500 market at all," Norman said.

However, Soft Warehouse CEO Nathan Morton claimed his firm's 30% corporate clientele has grown 4% to 5% in the last two months. "We are seeing a lot of companies asking for bids that we've not done business with before," Morton said.

Morton attributed the increased number corporate clients to the recession economy as well as dealer woes. "Businessland's problems are making a lot of companies diversify to more than one supplier," he said.

NEW DEALS

AST scores $1M deal

On its largest sale of Intel Corp. I486-based personal computers, **AST Research, Inc.** will supply the **Tokyo Grain Exchange** with more than 70 Premium 486/33 PCs. The contract is reportedly valued at more than $1 million.

Sizzler Restaurants International has chosen to implement **NCR Corp.**'s 2760 Food Service System and PCs nationwide. The contract is valued at approximately $2.5 million over the next several years.

Datamedia Corp. has secured a contract valued at more than $2 million with the United Nations' Rome-based **Food and Agriculture Organization**. Datamedia's Netmate/SX workstations will be used for both administrative applications and access to operation and project information residing on IBM, Digital Equipment Corp. and other manufacturers' equipment.

Separately, **Datamedia** was awarded a subcontract under the **Baltic and International Maritime Council** Maritime Community Network contract. Datamedia will supply workstations and act as the manufacturing and materials integration company for a systems integrator working on the project.

There Of Good Reason These Are

ProAudit

ProOptimize

ProSecure

ProUtility

Three Zeniths for the desktop

BY MICHAEL FITZGERALD
CW STAFF

MOUNT PROSPECT, Ill. — Zenith Data Systems released three new desktop machines earlier this month — including its first based on the Intel Corp. I486 chip — and a new laptop. It also announced price cuts on two existing laptop models.

The Z-486/25E Model 170 features a 64-bit memory bus and a Texas Instruments, Inc. Graphics Architecture display card that retains IBM Video Graphics Array (VGA) compatibility and provides a 1,024- by 768-pixel resolution.

Rated at 11.7 million instructions per second, according to Zenith, the system includes 4M bytes of random-access memory, expandable to 64M bytes, and a 170M-byte hard drive. It has three slots for Extended Industry Standard Architecture cards and a 1.44M-byte floppy drive. It is scheduled to be available in the first quarter of 1991 and will retail for $9,999, which is less than Zenith's current high end, the $10,599 Z-386/33E with a 150M-byte hard drive.

The Z-486/25E Model 80 uses standard VGA and an 80M-byte hard drive. It will be available next month and will retail for $8,599.

"Zenith has been satisfying high-end customers for some time, so I expect this product to be well tested and well run, and I expect that this will be able to satisfy those high-end users," said Robert Charlton, high-end systems analyst at Dataquest, Inc. in San Jose, Calif.

Zenith also announced the Z-386SX/20, which will offer VGA, 2M bytes of RAM (expandable to 16M bytes), a 32K-byte memory cache (expandable to 128K bytes) and a 40M- or 80M-byte hard drive. Retail prices will be $3,499 or $3,999. Both will be available this month.

On the laptop front, Zenith introduced the Slimsport 286, a nine-pound portable that runs at 16 MHz and has a 9½-in. backlit VGA screen and a 20M-byte hard drive. It retails for $3,699.

In addition, Zenith cut $300 from the price of its 286-based Supersport 286E Models 20 and 40 and $500 from its 386SX-based Supersport SX Models 40 and 120.

Zenith also announced that it will introduce the ZCM-1650 monitor to support TI's card in the first quarter of 1991. The ZCM-1650, a 16-in. display that switches between VGA and TI's card, will retail for $1,999.

No more Z-1000

Zenith Data Systems, the Groupe Bull subsidiary, has begun telling its resellers it will no longer make the Z-1000, its multiprocessor dedicated Unix machine.

When the company introduced the Z-1000 in 1988, it was possibly the first multiprocessor system to be based on an IBM Personal Computer AT bus. Zenith began shipping the Z-1000 in 1989, with a two-processor base model and a six-processor top-of-the-line machine.

Glen-Eric Nelson, Zenith's spokesman, said the decision was not made because of sales figures but rather was "based on the belief that Bull HN is in a better position to address the market for dedicated Unix systems."

Robert Charlton, a high-end systems analyst at Dataquest, Inc., said he was not surprised by the move. "[Zenith] and Bull are simply concentrating on aiming to make what they're profitable in," he said.

e Are Hundreds
ns To Choose Us
To Support DB2.
Our Latest Four.

With the addition of these four new products to our ProSeries for DB2™ product line, On-Line Software solidifies its position as an industry leader in supplying solutions and support for DB2.

For the Database Administrator, we offer *ProAlter®/Plus*—for DB2 catalog analysis and object maintenance; and *ProBuild**—to create customized DB2 tools and prototypes 50% faster. These are now joined by *ProSecure**—the leader for managing DB2 security; *ProAudit**—the custom audit trail facility for DB2; and *ProUtility**—for automated scheduling and administration of DB2 utilities. All these will help you meet deadlines and simplify the complexities of DB2.

For the Application Programmer, we have *ProEdit®*—the industry leader for complete DB2 application testing. This is now complemented by *ProOptimize**—which provides automated recommendations for efficient DB2 application tuning. These speed applications into production, improve DB2 application performance, while saving you time.

On-Line Software's newly expanded ProSeries for DB2, coupled with its full range of DB2 courses, and complete technical and management DB2 consulting services, will help the DBA and Application Programmer increase their speed, quality and effectiveness, and give your company a competitive edge.

Naturally, On-Line Software offers over twenty years of leadership in IBM® systems software and a lifetime trade-in guarantee.

As you can see, our commitment to DB2 solutions and support goes beyond a lot of talk.

For more information, please call 800-642-0177. In Canada, call 416-620-4844. Outside the U.S. and Canada, call 44-71-631-3696.

On·Line Software
INTERNATIONAL

ProEdit and ProAlter/Plus are registered trademarks and * indicates a trademark of On-Line Software International.
IBM is a registered trademark and DB2 a trademark of International Business Machines Corporation.

In the tim
to read this page, th
could have pri

Running at top speed,

the Epson DFX-8000 could print every word of this ad in 1.8 seconds.

Calculations based on average reading time of 100 seconds per page. SmartPark is a trademark of Epson America, Inc. Epson is a registered trademark of Seiko Epson Corporation. ©1990 Epson America, Inc., 2780 Lomita Blvd., Torrance, CA 90505. **(800) 922-8911.**

e it takes
e Epson DFX-8000
nted 52 more.

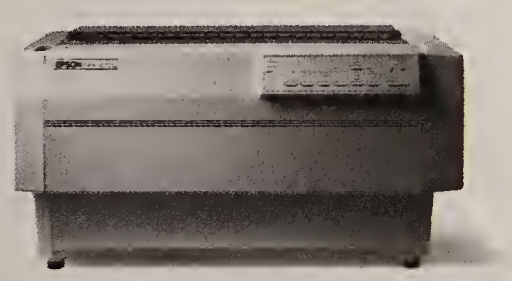
There is an elite group of high-volume printer users for whom speed is measured not in hundreds of characters per second, but in thousands. For those of you, the quick minds at Epson® have created the new DFX-8000. It is, quite simply, the fastest printer Epson has ever made.

It is also compelling proof that an inspired piece of engineering need not be accompanied by an inflated price tag.

Through a highly innovative two-in-one print head design, the engineers at Epson were able to double the speed of the DFX-8000—at a cost significantly below that of the average line printer.

While few printers can match the sheer speed of the DFX-8000, even fewer can match the ease with which it handles. Productivity-enhancing conveniences include Epson's advanced Smart-Park™ paper handling, dual paper feeds and an optional automatic paper cutter, plus other useful features rarely found on line printers.

As with every Epson, compatibility and reliability are a foregone conclusion. The DFX-8000 will easily connect to your PCs, minis and mainframes, and will run day after day without the least bit of trouble.



At 1066 characters per second, Epson's fastest printer ever.

The combination of speed, features and reliability offered by the DFX-8000 is enough to accelerate the pulse of the most demanding high-volume printer user.

That is why, when you finish reading, we encourage you to watch it print a few hundred pages, in person.

It will only take a few minutes of your time.

Engineered For The Way You Work.™

EPSON

Software tracks neural networks

BY JIM NASH
CW STAFF

For those professionals who resent working with computers, it might be heartening to know that machines are increasingly under the same pressure to get along and to justify their actions.

Neural networks are being asked to work better with other computers and to explain to humans why they did what they did. It is the price that neural network manufacturers are paying to reach the coveted mainstream environments.

Neuralware, Inc. announced updates to its Neuralworks Professional II Plus software recently. The Pittsburgh-based company said it is adding Flashcode, a subprogram that translates its computations directly into C source code.

Industry observers said it may be the first neural network company to embed that ability in its own software. Neuralware is also adding a subprogram that explains why it came to its conclusions, a task few such applications offer, according to Neena Buck, an analyst at market research firm New Science Associates, Inc. in Southport, Conn.

Jeff Lin, a systems analyst at Texaco, Inc. in Houston, said he has been frustrated using neural networks to help develop in-house artificial intelligence tools. Lin said most neural networks have been unable to take the programs they have written and translate them easily into C source code for use in conventional production computers. It has also been difficult to discern how and why decisions were made by the networks.

Using complicated algorithms and architectures, neural networks are able to "learn" how to do assigned tasks better as they do their work. But, Lin pointed out, "leaving neural networks to do standalone processes in a proprietary language is not acceptable." They must be able to tell conventional machines how to do what the neural network has developed.

He and several information systems professionals have been testing a beta version of Neuralware's II Plus. "Before, we had to interpret what the neural network had come up with and reconstruct the new processes in C," said Tom Wright, senior vice president of research and development at Frontier Financial Corp. in Houston. Frontier uses neural networks to decide when to buy and sell in futures markets such as currencies, crude oil and U.S. Treasury Bonds. The system spots key patterns in data and present conditions to predict future situations.

Lin explained that there are in-house and commercially available programs that perform the translation, but they are clumsy add-ons for systems that by definition have nimble reflexes. Texaco uses neural networks running on IBM Personal System/2s, reduced instruction set computing workstations and minicomputers. Neural networks use II Plus, he said, to work with AI programs. And, according to Bill Davis, a software design engineer in Texas Instruments, Inc.'s defense systems unit, II Plus explains how it came to its conclusions.

While the market for neural networks currently hovers around $15 million to $20 million in the U.S., analyst Les Hellenack at International Data Corp. in Framingham, Mass., said it should double each year for the foreseeable future as long as manufacturers continue to make the networks more interoperable.

II Plus, running on DOS, OS/2, Unix and Apple Computer, Inc.'s Macintosh OS is expected to be shipped later this month for $1,895 to $4,995.

© 1990 Bell Atlantic
*Windows, Lotus 1-2-3, and dBase are trademarks of their respective companies.

SQL server library debuts

SAN JOSE, Calif. — Automated Design Systems, Inc. has introduced Windows Workstation SQL Server Library, a Dynamic Link Library that translates Gupta Technologies, Inc.'s SQLwindows function calls into Microsoft Corp. SQL Server calls.

Steven Bachman, Automated Design's president, claimed developers have been waiting for a Windows-based front end for SQL Server.

Noting that many corporations are moving toward standardizing on Windows for all their end-user computing needs, Bachman said Windows Workstation SQL Server Library will enable these users to provide a Windows database solution using the SQLwindows fourth-generation language programming language in concert with SQL Server.

The library is a set of functions that can be embedded in Gupta's SQLwindows-based applications. Programmers reportedly can modify existing SQLwindows applications to run with SQL Server or build new Windows programs from the database from scratch. In addition, Automated Design's library permits SQLwindows to support a number of SQL Server database management extensions.

Dwayne Walker, Microsoft's product manager for SQL Server, said the Windows Workstation SQL Server Library will give Gupta users a migration vehicle to SQL Server.

The Windows Workstation SQL Server Library Developer's Kit costs $2,495 until Dec. 15 and $3,495 thereafter. Runtime licenses are available for $95 per user.

Daly

CONTINUED FROM PAGE 47

Systems, Sony and Canon — have actually delivered a system. Everyone else keeps saying that when their products arrive, they will make the others seem like Tinkertoys.

Recently, the thin ice of outlandish promises finally cracked and gave way underneath Go Corp., a Foster City, Calif.-based start-up that still hasn't delivered a product one can lay a hand on.

Founder Jerry Kaplan frankly admitted that in the three years since his company planted its flag, some of the biggest names in the computer industry have been drawn to the technology like bugs to a barbecue.

In addition to what has already arrived, companies such as Apple, Hewlett-Packard and Compaq have all indicated that they are working on pen-based technology, while Microsoft is reportedly preparing pen-based computing software called Windows H for release next fall. A few other start-ups are also crafting pen-based systems.

You think Kaplan wasn't suddenly sitting up ramrod-straight in the middle of the night in a cold sweat? Think again. "It didn't make any sense to compete with them," Kaplan said recently.

Instead, Go quietly decided to develop the operating system software that drives the hardware.

Go intends to take the Microsoft approach of widely licensing its operating system software in order to establish a de facto industry standard. It has already had one stellar client: IBM.

While there is no ignominy in admitting your limitations, the act of publicly backpeddling before you even have a product out the door doesn't make for a great image.

I'm not here to fault Go. Far from it. Being first to market is important for gaining recognition as a leader, but it's not necessarily the best place for success in an emerging market.

The Apple Lisa, for instance, was one of the pioneers of graphical user interfaces but failed miserably with customers. It took the Macintosh to succeed, and even that took time.

Being first to market is a bit like surfing: Catch the wave too soon and you'll spend a lot of energy paddling for little effect; catch it too late and you'll wipe out as it breaks on top of you.

But the vendors are playing a dangerous psychological game with their users — or I should say, their potential users. No matter how good the much-hyped machines are, they probably won't be as good as many envision.

While insiders say that Go has many irons in the fire, the painful lesson learned from Go should be that companies need to be careful about talking about things they don't have.

Most analysts agree that it will probably be some time before pen-based computers arrive in earnest — perhaps a year or more.

If the concept of pen-based computing matures, if potential users begin to understand its capabilities more fully and if technology makes the devices more versatile, then sparks could fly. Until then, however, please spare us the hot air.

Daly is a *Computerworld* West Coast senior correspondent.

Microsoft opens developer vault

BY JAMES DALY
CW STAFF

REDMOND, Wash. — Microsoft Corp. opened its arms to a wider range of Windows Version 3.0 software developers earlier this month by unveiling a strategy that adds more options to the Windows development environment and offers an inside peek at publishing documentation on internal Windows formats.

The strategy, called Open Tools, will support a wider range of programming languages and offer more powerful internal features, including the ability to add more sophisticated performance analysis devices and a spruced-up debugger to the kernel. "Debugging under Windows has always been difficult," said Mansour Safai, president of development firm Multiscope, Inc.

Microsoft officials said that although they have sold tens of thousands of their Windows Software Development Kits, the kits appeal primarily to more advanced programmers who want to broaden the scope of programming options. "Whatever some clever programmer can dream up, we want to make sure that tools are available to make it happen," said Brad Silverberg, vice president of systems software.

Silverberg added that developers typically write to Windows in the C language, but Open Tools will allow a wide range of programming language options, including Pascal, LISP or C++.

Microsoft officials said such additions were necessary to accommodate the diversity of programmers who want to write specifically to the 3.0 environment but have not programmed for Windows before. Many of the earlier Windows 3.0 applications were simple rewrites of earlier programs.

Products exploiting the Open Tools strategy are expected from Microsoft and other vendors during the first half of 1991, Silverberg added.

"WE HAD TWO CHOICES: BUILD A NEW DATA CENTER OR GET SOME PCS AND REALIA COBOL."

Michael Abrahamson
Wagner Stott Clearing Corporation
subsidiary of Merrill Lynch

"Our mainframe overload was severe, and there wasn't room to bring a larger, water-cooled mainframe into the existing data center," Abrahamson explained. The solution was PCs with Realia COBOL and RealCICS.

"One program took 50 minutes to execute on our high-end 4381," said Abrahamson. "The same program, with the same file, ran in 4:03 minutes after being downloaded to the PC.*

"We're very satisfied with the PC as a workstation environment. CICS COBOL programs compile in seconds, not minutes. Realia's done an excellent, very faithful mainframe emulation.

"The software is robust and the technical support is very good. It's worth a lot to know that you have somebody knowledgeable to deal with."

Call Realia for a free evaluation of the Realia programming environment.

*PC was a 20 MHz 80386 AT clone with an ESDI-controlled hard drive. Average access time of hard drive was rated at 23 milliseconds.

REALIA®

U.S.: 312/346-0642 • U.K.: 071/602-8066 • CANADA: 613/725-9212

NEW AT COMDEX/FALL '90

The following were among the products announced at Comdex/Fall '90, which was held last week in Las Vegas.

Board-level devices

Aview Technology, Inc.'s Desktoptv was designed to convert an Intel Corp. 80286- or 80386-based IBM Personal Computer XT, AT or compatible into an enhanced television.

The add-on board can receive 119 channels, including VHF, UHF and cable. Television controls are operated from a keyboard, and sound is provided by an external speaker, the vendor said.

The product is available in multifrequency and IBM Video Graphics Array versions, which are scheduled to be released in January and March, respectively.

Both versions are priced at $395.

Aview Technology
The Davidson Building
255 W. Julian St.
San Jose, Calif. 95110
(408) 287-1700

Peripherals

Chinon America, Inc. has designed an IBM Personal Computer-compatible desktop color scanner that runs under Microsoft Corp.'s Windows 3.0.

The DS-3000 includes a color converter and Colorset software that enables users to scan full-color images and three-dimensional objects, according to the vendor.

The product lists at $995 and is scheduled to be released in January. The color converter and Colorset software can be purchased as a separate add-on package that costs $395.

Chinon America
660 Maple Ave.
Torrance, Calif. 90503
(213) 533-0274

Konica Business Machines U.S.A., Inc.'s LP-3110, a laser printer that operates at 10 page/min., includes 24 fonts and 512K bytes of memory.

It features 300 by 300 dot/in. resolution and is compatible with software emulation packages for Hewlett-Packard Co.'s Laserjet Series II, Epson America, Inc.'s FX-850, Diablo Systems, Inc.'s Diablo 630 ECS and IBM's Proprinter.

The product is priced at $1,995.

Konica Business Machines
500 Day Hill Road
Windsor, Conn. 06095
(203) 683-2222

Princeton Graphic Systems, Inc. has announced a 1,280- by 1,024-pixel color monitor that supports autosynchronous resolutions of 1,024 by 768 pixels to 1,280 by 1,024 pixels and multisync scanning that ranges from 50Hz to 150Hz.

The Ultra 2000 provides users with a clear screen image with a 70-Hz refresh rate. It can be used for performing desktop publishing applications as well as computer-aided design, engineering and software engineering tasks.

The monitor lists at $3,395.

Princeton Graphic Systems
1100 Northmeadow Pkwy.
Roswell, Ga. 30076
(800) 221-1490

Viewsonic 5 is a color monitor developed by Viewsonic that features 1,024- by 768-pixel image resolution and a 0.25mm dot pitch.

The 14-in. noninterlaced screen includes linear tracking circuitry that automatically scans horizontal frequencies between 31 KHz and 55 KHz, according to the vendor.

The monitor can be used in IBM Personal Computer XTs, ATs or compatibles, Apple Computer, Inc. Macintosh IIs or Sony Corp. C1304s. It is priced at $999.

Viewsonic
12130 Mora Drive
Santa Fe Springs, Calif. 90670
(213) 944-9559

Data storage

Disk Technologies Corp.'s RHD 60, a 60M-byte removable hard disk drive designed for IBM Personal Computer-compatible portables, laptops and desktop systems, features an average access time of 21 msec. and a data rate of 7.5M bit/sec.

The drive is priced at $865.

Disk Technologies
147 W. Lyman Ave.
Winter Park, Fla. 32789
(800) 553-0337

Version 1.2 of Flagstaff Engineering's Papertamer document storage and retrieval system features removable media and multiple storage devices.

The product enables users to scan document images into an IBM Personal Computer and store the images on a hard or optical disc drive.

Papertamer is available in three versions: a personal edition ($195), a professional standalone version ($795) and a professional network version ($2,995).

Flagstaff Engineering
1120 Kaibab Lane
Flagstaff, Ariz. 86001
(602) 779-3341

Prairietek Corp.'s Prairie 242 is a 42.8M-byte hard drive designed for notebook and laptop computers.

The product is the first of five 2½-in. hard disk drives that the company plans to roll out within the next year.

It includes a single-source power supply that requires +5 volts to operate, and a patented ramp head loading mechanism parks the heads off the media when a drive is shut down, the vendor said.

Prairie 242 is priced at less than $500.

Prairietek
1830 Lefthand Circle
Longmont, Colo. 80501
(303) 772-4011

Sytron Corp. has announced the third member of its Sytos Plus family of file backup management systems.

The Sytos Plus for Windows File Backup Manager enables users of Microsoft Corp.'s Windows to schedule continuous automated backups that operate as background tasks, the vendor said.

The product supports 80M-byte mini data cartridge and logical devices, including erasable magneto-optical drives. Support for floppy disk and 40M-byte to 2.3G-byte tape drives is also featured, according to the vendor.

The product, scheduled to ship in April 1991, costs $225.

Sytron
117 Flanders Road
Westboro, Mass. 01581
(508) 898-0100

Systems

Modgraph, Inc. displayed a line of portable personal workstations equipped with Intel 80386 33-Hz and I486 25-Hz caching models.

Both color and monochrome models include two 16-bit expansion slots, an internal hard disk drive with a maximum capacity of 200M bytes and built-in 5¼-in. 1.2M-byte and 3½-in. 1.44M-byte disk drives.

The monochrome Model GX-2286M-12 is priced at $3,195, and the GX-2486C-25 color model costs $11,500.

Modgraph
149 Middlesex Tnpk.
Burlington, Mass. 01803
(617) 229-4800

NEW PRODUCTS

Database management systems

Raima Corp. has announced three products that can be linked with its Db Vista III database management system.

Db Query for Microsoft Windows can be used as a standalone reporting tool or built into an application. It is included with a Microsoft Corp. Windows version of Db Vista III ($1,495).

Easy Query ($99) is a querying and report-writing tool that enables users who do not understand SQL to generate reports from Db Vista III applications.

Powercell ($695) enables C language developers to embed integrated spreadsheet functionality into their applications.

Db Query for Microsoft Windows and an MS-DOS version of Powercell were released last month. A DOS version of Easy Query is scheduled to be released later this year.

Raima
3245 146th Place S.E.
Bellevue, Wash. 98007
(206) 747-5570

Pioneer Software Systems, Inc. has announced Version 2.5 of Q+E, a database query tool that provides a single graphical user interface for various database systems.

The product is completely integrated with Microsoft Corp.'s Windows Version 3.0 and can be used as a stand-alone database query tool or with Microsoft's Excel or other Windows applications.

System requirements include an IBM Personal Computer or compatible with a minimum of 640K bytes of memory and a 20M-byte hard disk. Q+E Version 2.5 is priced at $149.

Pioneer Software Systems
5540 Centerview Drive
Raleigh, N.C. 27606
(919) 859-2220

Concentric Data Systems, Inc. has announced that a version of its R&R Report Writer report writing tool has been designed to work with Version 2.3 or higher of XDB System, Inc.'s XDB-SQL Database Manager and XDB Database Server software packages.

R&R Report Writer for XDB-SQL enables users to create various types of reports without any need for programming. It automatically generates SQL queries and provides a what-you-see-is-what-you-get screen painting feature for making calculations and sorting records.

The product is priced at $299 per copy. A six-pack local-area network version costs $1,499.

Concentric Data Systems
110 Turnpike Road
Westboro, Mass. 01581
(508) 366-1122

Odesta Corp. has announced a new version of Double Helix, a multiuser relational database software package designed for Apple Computer, Inc. Macintosh and Digital Equipment Corp. VAX environments.

Version 3.5 of Double Helix includes an enhanced user interface equipped with pop-up menus, check boxes and radio buttons. The product runs on Macintosh Plus, SE or II series computers.

The product is scheduled to be available in the fourth quarter and is priced at $595.

Odesta
4084 Commercial Ave.
Northbrook, Ill. 60062
(708) 498-5615

PC systems software

Eighty Six Works has announced a product designed for Intel Corp. 80386-based personal computers.

The ECP3 features multitask support for applications done on systems operating under Digital Research, Inc.'s DR-DOS, PC-DOS or MS-DOS. Each task has a private system configuration with 128K to 896K bytes of memory. The product is priced at $49, and a full evaluation version costs $10.

Eighty Six Works
P.O. Box 36272
San Jose, Calif. 95158
(408) 978-8027

Peripherals

Xante Corp. and Phoenix Technologies Ltd. have announced Powerscript, a printer-resident, Adobe Systems, Inc. Postscript-compatible controller that features reduced instruction set computing technology based on an Advanced Micro Devices, Inc. 29000 microprocessor.

The product increases the processing of Apple Computer, Inc. Laserwriter printers.

In addition, it provides enhanced resolutions of 300 by 300 dot/in., 300 by 600 dot/in. or 300 by 1,200 dot/in., according to Xante.

Powerscript was jointly developed by both companies and is priced at $1,695. It is scheduled to ship this month.

Xante
23800 Highway 98
Montrose, Ala. 36559
(205) 990-8189

Focus Information Systems, Inc. has announced a Super Video Graphics Array card designed for IBM Personal Computer XTs, ATs or compatibles.

The 2 the Max VGA 4000 incorporates Tseng Laboratories, Inc.'s ET4000 graphic chip set and features memory configuration that can be expanded to 1M byte.

The product provides 1,024-by 768-pixel resolution and 256 displayable colors in standard and extended graphic modes, according to the vendor.

Pricing ranges between $295 and $395, depending on memory configuration.

Focus Information Systems
42840 Christy St.
Fremont, Calif. 94538
(415) 657-2845

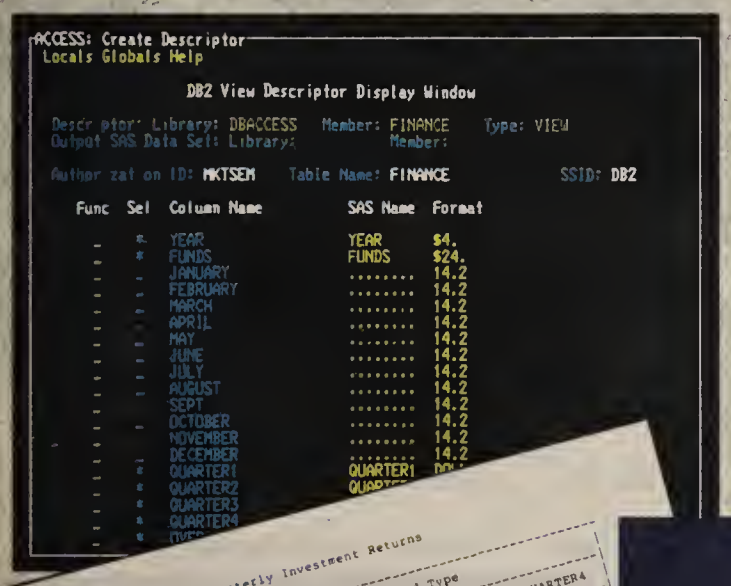
Now Your Company's Islands of Information are Within Easy Reach.

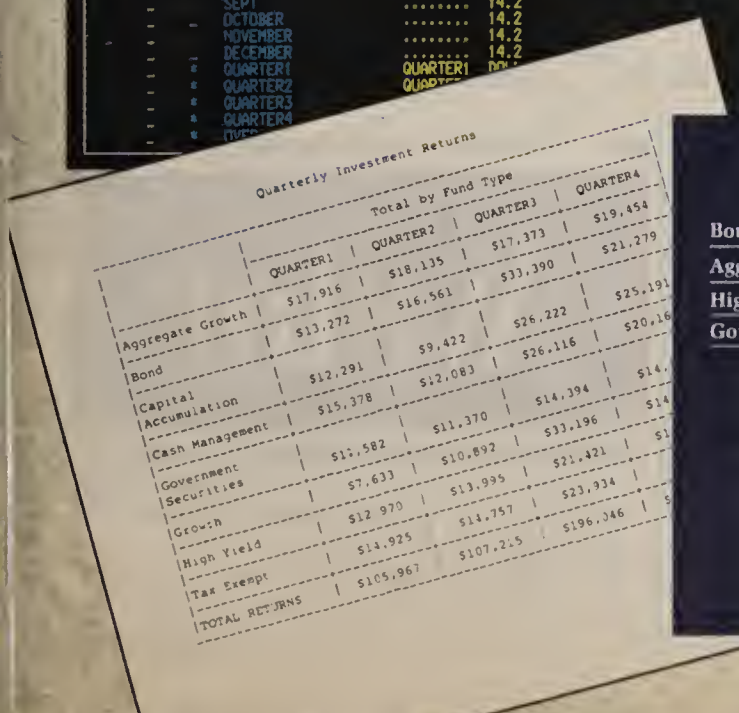
Announcing the SAS® System's Transparent Data Access

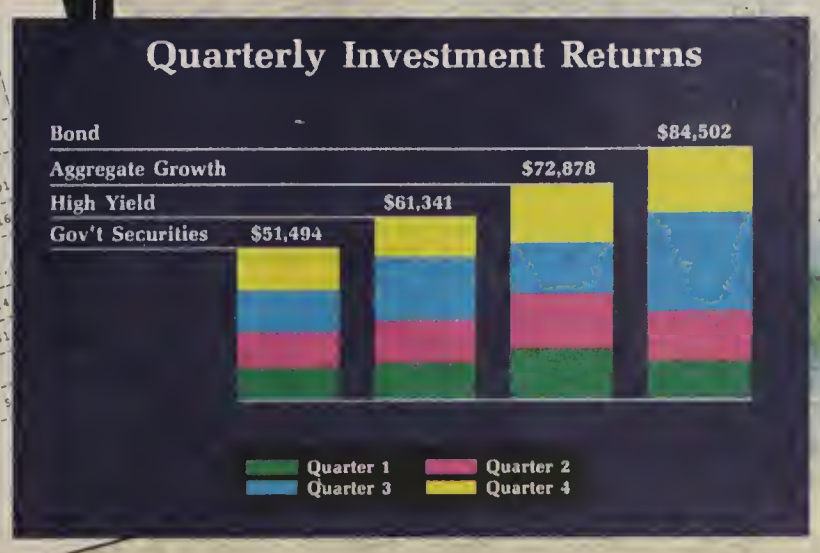
If you spend more time getting *to* your data than getting information *from* your data, it's time you got the SAS System—the world's #1 applications system. No other software makes it so easy to reach all the remote islands of information within your company—or to analyze and present data in so many different ways.

The SAS System's exclusive Multiple Engine Architecture lets you access data stored in a variety of structures across a wide range of hardware platforms . . . without having to know data base terminology or sacrificing data base security. Easy-to-follow menus take you inside DB2, SQL/DS™, ORACLE®, Rdb/VMS™, Lotus 1-2-3®, dBASE®, SYSTEM 2000®, and other data bases. What's more, the SAS System's support of SQL™ gives programmers a standard language for data query. You can also use the SAS System to access raw data files in any format—even files with messy or missing data.

Once you've accessed your data, the SAS System's integrated data analysis, reporting, and graphics capabilities will help you turn bare facts into meaningful business information. Choose from such applications as forecasting . . . operations research . . . project management . . . quality improvement . . . and more. All backed by expert technical support, consulting services, documentation, and training—direct from SAS Institute Inc., one of the world's most respected names in software.







Call us now at (919) 677-8200 to receive your free SAS System executive summary . . . plus details about a free no-risk 30-day software trial. In Canada, call (416) 443-9811.

The SAS® System. More Choices for More Applications than Any Other Software.

SAS®

SAS Institute Inc.
Software Sales Department
SAS Circle ☐ Box 8000
Cary, NC 27512-8000
Phone (919) 677-8200
Fax (919) 677-8123

The SAS System runs on mainframes, minicomputers, workstations, and personal computers.

SAS is a registered trademark of SAS Institute Inc. Other brand and product names are registered trademarks or trademarks of their respective holders.

Copyright © 1990 by SAS Institute Inc.
Printed in the USA.

How others see the Macintosh-to-mainframe connection.

How Avatar sees it.

When it comes to system integration, you don't have to treat the Mac differently than any other device on your network. Introducing the MacMainFrame Series, the broadest range of Macintosh-to-mainframe connectivity options available.

More choices. More solutions.

Now, in an integrated set of solutions, local or remote Mac users in Token Ring, SDLC or coax environments can tap centralized information to make every Mac user's desktop more powerful.

MacMainFrame distributes terminal emulation, file transfer, printer emulation and mainframe graphics across a wide variety of networking schemes.

Since it's fully AppleTalk compatible, EtherTalk, TokenTalk and LocalTalk networks are part of the solution, too.

For customization, there's Avatar's Programmer's Toolkit, a full range of Applications Programming Interface (API) tools. For example, Avatar's Hypercard API has been used to develop a front end system to PROFS, IBM's electronic mail system.

The MacMainFrame difference.

Unlike some Mac-to-mainframe connections, MacMainFrame enhances the benefits of the Macintosh user experience.

Since MacMainFrame is completely IBM 3270 compatible, it has no impact on normal mainframe operations. The result? An integrated working environment that increases productivity and reduces headaches.

Something else we see. Service.

With eight years of experience, Avatar offers something beyond products and technology. It's called responsiveness. You see, as the 3270 connectivity specialists, we have helped to integrate Macintosh computers and PC printers into many different environments. Which means we can do the same for you. With a single integrated set of solutions for Token Ring, SDLC, and coax, both standalone and via gateway.

To find out how, call this number toll free at

1-800-289-2526.

You'll find that we understand Macintosh-to-mainframe connectivity like no one else. So as your network options continue to grow, Avatar can help you see the forest through the trees.

Avatar.

65 South Street, Hopkinton, MA 01748

DCW7

© 1990 Avatar Corporation.

DON'T SETTLE FOR SECOND.

Subscribe to COMPUTERWORLD, and be among the first to read about the hottest news in the information industry. 51 issues for just $38.95.* Act now!

First Name MI Last Name

Title Company

Address

City State Zip

Please answer questions to qualify for this rate.

1. BUSINESS/INDUSTRY (Circle one)

10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medicine/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government - State/Federal/Local
65. Communications Systems/Public Utilities/ Transportation
70. Mining/Construction/Petroleum/Refining/Agric.
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Distr./Retailer
75. User: Other _____
95. Vendor: Other _____
(Please specify)

2. TITLE/FUNCTION (Circle one)

IS/MIS/DP MANAGEMENT
19. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
21. Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt., Dir./Mgr. PC Resources
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Mgrs., Suprv. of Programming, Software Dev.
32. Programmers, Software Developers
60. Sys. Integrators/VARs/Consulting Mgt

OTHER COMPANY MANAGEMENT
11. President, Owner/Partner, General Mgr.
12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer
41. Engineering, Scientific, R&D, Tech. Mgt.
51. Sales & Mktg. Management

OTHER PROFESSIONALS
70. Medical, Legal, Accounting Mgt.
80. Educator, Journalists, Librarians, Students
90. Others _____
(Please specify)

3. COMPUTER INVOLVEMENT (Circle all that apply)
Types of equipment with which you are personally involved either as a user, vendor, or consultant.

A. Mainframes/Superminis
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Local Area Networks
F. No Computer Involvement

Address Shown: ☐ Home ☐ Business

Basic Rate: $48 per year. *U.S. Only

COMPUTERWORLD

E2047-0

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

COMMENTARY

Ellis Booker

Babel in the battlefield

If the U.S. and the multinational force it has assembled in the Saudi desert go to war against Iraq, battlefield communications among ourselves and our allies will revert to a surprisingly low-tech procedure.

According to military experts familiar with the situation, liaison officers with mobile radios will be dispatched among the various forces and entrusted with the job of keeping their own commands informed about the position of allied troops.

Military planners would be the first to admit that knowing the location of one's own soldiers during the haze of battle is at least as important as knowing the same about one's enemy.

For the millions spent on command, control and communications — known at the Pentagon as C3 — something more elegant than the military equivalent of a sports commentator would seem both preferable and possible.

"But you have to realize, too, the ability to interoperate with other forces is not just a matter of compatible radios," explains Kirby Lamar, a retired army brigadier general and vice president and treasurer of the Armed Forces Communications and Electronics Association (AFCEA) in Fairfax, Va. "Procedures and languages are different . . . you'd need a human being in either case."

In fairness, NATO has worked for some time to ensure the technical interoperability of field communications equipment within the alliance.

The French company Thompson PLC, for example, developed a mobile terminal — a sort of battlefield version of a cellular phone — that was adopted for U.S. operations and is now being built for U.S. forces by GTE Corp.

However, it is not clear how much of the interoperability work has gone beyond voice radios and involves battlefield data communications such as the sophisticated, satellite-based Global Positioning System that U.S. forces use to pinpoint their positions.

Continued on page 68

GSA to launch encryption plan

BY GARY H. ANTHES
CW STAFF

WASHINGTON, D.C. — The U.S. General Services Administration (GSA) has won approval from an interagency panel to proceed with an ambitious plan to offer data encryption services to more than 1 million users of the Federal Telecommunications System 2000 (FTS-2000).

The GSA plans to offer two levels of end-to-end encryption over packet-switched networks: one for sensitive but unclassified data and one for classified traffic.

The approach was demonstrated in a two-week test earlier this year in which encrypted files and messages were sent over and between networks operated by AT&T and U.S. Sprint Communications Co., the prime FTS-2000 contractors.

The contract won two years ago by AT&T and Sprint was for a multibillion-dollar overhaul of Uncle Sam's aging, expensive and patchwork telecommunications system, the largest private telecommunications system in the world.

The companies are to provide six basic services — switched voice and data services, packet-switched service, video transmission service, dedicated transmission service and switched digital integrated service.

The basic offerings include a number of supporting services, but data encryption is not among them. However, a recent government study showed that 70% to 80% of the traffic carried over the FTS-2000 networks should be encrypted to protect confidentiality and ensure integrity. "Use of FTS-2000 is mandatory, but encryption is not," said Richard J. Kemp, a senior official in the GSA's Information Security Management Division. "And because of the budget situation, security is often the first thing to go."

According to Kemp, any of the 90 federal agencies now using FTS-2000 could go its own way with data security, attaching its own encryption devices to network hosts. "But one problem is you have to have a bucket of money to do it on your own," Kemp said. The Blacker front end, a device developed by Unisys Corp. for the National Security Agency (NSA) and approved by the NSA for use on FTS-2000 for data that is classified confidential or secret, costs about $8,000 for each user device and requires a $160,000 control center.

"[The Department of Defense] is always saying FTS-2000 doesn't meet their national security needs," said Michael Goldstein, director of communications technology at Vienna, Va.-based Information Strategies Group. "Now this will give them some added flexibility, some capabilities in locations where they may not have their own [classified] networks."

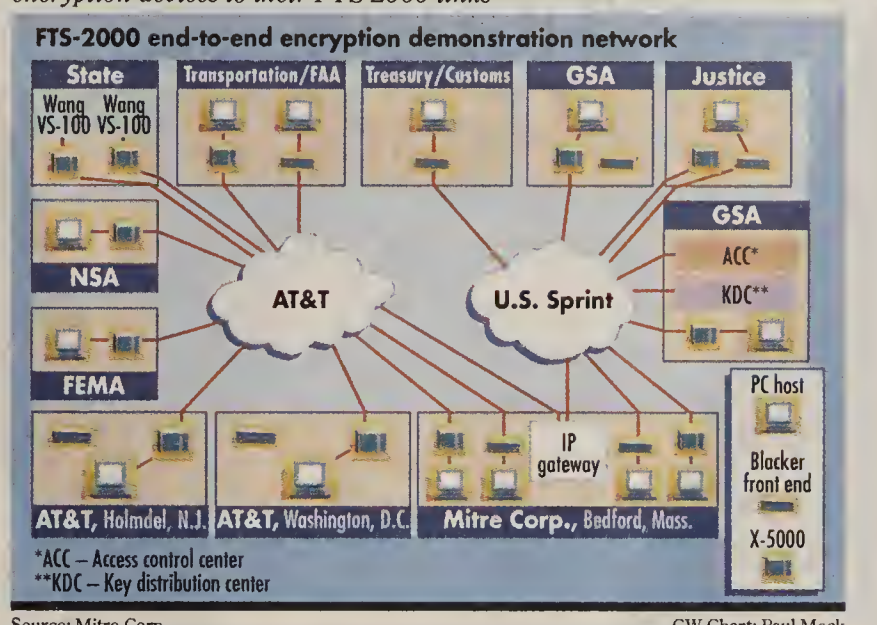
The GSA wants to offer a standard, turnkey service that users can request by checking a box on a form. The service would offer encryption for electronic mail, file transfer, interactive communications and interactive access to remote hosts. The GSA will provide installation, maintenance and support services and will recoup its front-end investment through a monthly user charge, which has not yet been determined. "We want to help user agencies implement security solutions at a reasonable cost," Kemp said.

The plan is timely. A number of reports from government auditors and congressional committees, particularly in the past year, have faulted agencies for

Continued on page 72

Cryptic

The General Services Administration (GSA) will allow all agencies to add encryption devices to their FTS-2000 links



Source: Mitre Corp. CW Chart: Paul Mock

IBM and Northern Telecom push host-to-Centrex link

BY ELISABETH HORWITT
CW STAFF

NEW YORK — IBM and Northern Telecom, Inc.'s recently announced host-to-Centrex link is being positioned as a potentially lower-cost vehicle for computer-integrated telephony applications that now run on host-to-private branch exchange (PBX) links.

The two vendors will be working with Nynex Corp. on a trial of such a service using Syracuse University's 711 emergency calling service as the test bed.

A growing number of Fortune 500 companies, such as American Express Travel Related Services Co., have meshed their hosts and PBX systems to support telemarketing and customer service and other intelligent networking applications.

However, said Frank Skidmore, director of telecommunications network systems at IBM, "The capital, people and skills investment involved in a private network is less attractive to some companies than paying incrementally through a public network."

Centrex service would put computer-integrated telephony applications within the reach of the smaller companies that typically use the local telephone service, agreed Tom Nolle, president of CIMI Corp. in Voorhees, N.J. However, such companies may still balk at having to set up the host as a telecommunications system that automatically responds to incoming calls, he added.

What is really needed is a service bureau that can set up and maintain the customer databases and applications for such companies, he said.

Initially, computer-to-Centrex applications will require that the user install an IBM Application System/400 host and that the local telephone company's central office be equipped with a Northern Telecom DMS 100 Supernode intelligent central office switch. However, IBM has announced plans to migrate its Callpath host-to-network switch interface to both System 390s and Personal System/2s, although no time frame has been given for availability.

In addition, IBM said that it is open to linking its hosts to other vendors' central office switches, and Northern Telecom said it would be looking at linking its switches to other types of hosts.

IBM and Northern Telecom also plan to make their connections fully compatible with Switched Computer Application Interface, the emerging standard for linking hosts and switches, vendor spokesmen said. This opens up the future possibility of users freely mixing and matching the two types of systems.

Nynex is committed to offering the type of service it will be testing at Syracuse University, a spokesman said. However, the three vendors still have to work out issues such as pricing, servicing and support, as well as how the offering will be packaged, Skidmore said. "Does IBM charge a quarter to add the extra feature on the AS/400 or does Nynex charge X for the whole thing, or does a systems integrator put the parts together?"

The trial is scheduled to start in the fall of 1991. Syracuse University's 711 service responds to calls from all over the school's campus relating to medical problems, fires and other emergencies. The application being tested will notify service operators automatically of the location where the call originated, "which can be important because the caller often doesn't know where he is," Syracuse University spokesman John Harvith said. The university is also considering other applications for the link in areas such as admissions and registration.

Northern Telecom and IBM are talking with all seven regional holding companies about using their connection as the basis for a Centrex service, according to Northern Telecom spokesman Michael Doss. IBM is open to connecting its hosts to other central office switch vendors, while Northern Telecom will be discussing links between the Supernode and other host systems besides IBM's, the vendors said.

The Leader In High-Speed Modems Offers Another Startling Performance Figure.

The best choice in high-speed, dial-up modems is now the best choice in V.32 modems.

Telebit has become the leading supplier of high-speed dial-up modems by delivering faster, more robust and reliable performance in mission-critical applications.

In fact, we created the market in 1985 with the TrailBlazer.®

Now we've put the same advanced technology and U.S.-built quality into a family of V.32 modems that sets a whole new standard of performance for CCITT-standard products.

Our T2500 was the first V.32 modem to deliver the full implementation of V.42 error-correction and V.42*bis* high-performance data compression capabilities. The T2500 supports all industry standards, as well as our patented multicarrier Packetized Ensemble Protocol® (PEP) technology.

Unlike competitive modems that hang up when line quality drops, PEP allows the T2500 to keep transmitting. Giving you real-world throughput that outclasses anything in its class.

You might think you'd pay a premium for this kind of performance, but actually our entire family of high-speed modems is very competitively priced, from $745 to $1495 (quantity one list price).

Call 1-800-TELEBIT today for more information on our V.32 modems. And the name of your nearest distributor.

Telebit. The highest quality, not the highest price.

TELEBIT®
When connectivity counts.

© 1990 Telebit Corp. (408) 734-4333 FAX: (408) 734-3333. Telebit, TrailBlazer and PEP are registered trademarks of Telebit Corp.

SELLING TECHNOLOGY HAS TAKEN A GIANT STEP BACKWARDS.

Remember when face-to-face, eye-to-eye selling was the only way business was done?

Somewhere along the way, the costs of direct selling got out of hand. Companies came to depend on indirect channels – and products became lost in an overcrowded marketplace.

Today, companies are rediscovering the power–and cost-effectiveness–of direct selling at INFORUM, the center stage for technology sales and marketing.

☐ I'm not interested in moving my business forward. But thanks anyway.

☐ I'm ready to take the first step. Send me information.

Can't wait to hear more? Skip the indirect channels and call us toll free. The number's on the right.

MAIL TO: INFORUM, ATTN: MARKETING DEPT.
P.O. BOX 56386, ATLANTA, GA 30303.

Name

Title Company

Address

City State Zip

Phone

INFORUM

SHOW THE WORLD WHAT YOU'VE GOT.

Here in Atlanta, you can deliver your product story directly to thousands of qualified buyers, every business day of the year. Undiluted. Undistorted. And you control the sales process. Completely.

INFORUM is the perfect environment for you to forge powerful personal relationships with new customers. It's an old-fashioned idea that is making a welcome comeback.

1-800-343-5045

Sonet moves to private sector

BY JOANIE M. WEXLER
CW STAFF

MIDDLEBURY, Conn. — The high-speed benefits of Synchronous Optical Network (Sonet) may start seeping into very large private networks early next year. By virtue of a deal recently struck with Alcatel Network Systems, General Datacomm, Inc. has become the first T1 vendor to throw its hat into the Sonet ring.

General Datacomm's Megamux TMS T1 multiplexers are set to ship with Alcatel's Sonet interface, and existing Megamux nodes can be upgraded. The upgrade price, according to General Datacomm, ranges from $10,000 to $80,000, which buys a range of bandwidth from 51M to 600M bit/sec. The bundled price for a new Megamux with a Sonet interface box ranges from $28,000 to $180,000.

"Our customers were pushing us hard to get this capability," commented Dan Young, General Datacomm's vice president of marketing. "And we're seeing many companies trying to negotiate with their carriers for Sonet capability on an individual case basis."

Optical standards

Sonet is an emerging standard for a fiber-optic networking infrastructure that defines channelized bandwidth in multiples of 51M bit/sec. up to 2.4G bit/sec. In addition to offering a wealth of bandwidth, Sonet provides for network management overhead and employs a standard optical interface. Use of a standard interface should allow public telecommunications carriers — which currently represent the majority of the Sonet equipment market — to interoperate with private vendors' gear, giving users more flexibility in their network configurations.

Companies in areas where Sonet services are available from public carriers or those running "dark" fiber — their own fiber, not cable leased from a phone company — could use the Sonet-interface capability to multiplex several T1s over the broadband transport vehicle.

Such companies will be scarce for a couple of years, however, according to Rick Malone, principal at Vertical Systems Group, a market research firm in Dedham, Mass. Malone said that "in 1990, there has been no real dollar market for Sonet" and added that he expects early Sonet adopters to be "large companies that have been operating T3 networks for three or four years" and need to go beyond those networks' 45M bit/sec. speeds.

He cited imaging as the main application that will emerge to drive users to the high-bandwidth promise of Sonet. Vertical Systems Group estimated that the industry's bandwidth requirements are doubling every three years on average.

Growth in remote local-area network interconnection and distributed processing applications will join imaging in forcing firms into the Sonet hierarchy in droves by 1994, Malone said. According to Vertical Systems Group, the remote LAN internetworking market grew 42% to $373 million from 1989 to 1990.

In the meantime, Malone cited such existing T3 users as The Boeing Co., General Electric Co., IBM and Electronic Data Systems Corp. as likely Sonet candidates for 1991. "These companies also happen to have a lot of clout with the carriers," he said, explaining that Alcatel's strategy for getting its Sonet interface into the private sector is to spur users to pressure the carriers to pick up their pace with Sonet deployment.

Commented Bill Hogan, director of Sonet product line management at Raleigh, N.C.-based Alcatel, "The Sonet product handles all of today's network needs. It will convert all of today's electrical signals [such as T1 and T3] and incorporates mapping for [Fiber Distributed Data Interface] and other optical signals of the future."

We're the largest independent computer service company in the world, with the largest problem-solving database. Giving us the experience and the support system necessary to service the full range of your computer needs.

We handle over 5000 products from 500 manufacturers, from mainframes to departmental networks. Providing a broad range of software and hardware support services. But, more important, we handle problems. Individual problems. Your problems. We're Bell Atlantic Business Systems Services supplying Sorbus® Service. Taking care of all your needs through a single source. And a single phone number. Please call 1-800-767-2877.

Bell Atlantic
Business Systems Services
We're More Than Just Talk.®

© Bell Atlantic

Hannover, Germany, 1990: European experts judging at CeBIT, the world's largest computer exposition, give their top design award to the Wyse PC Model 3225.

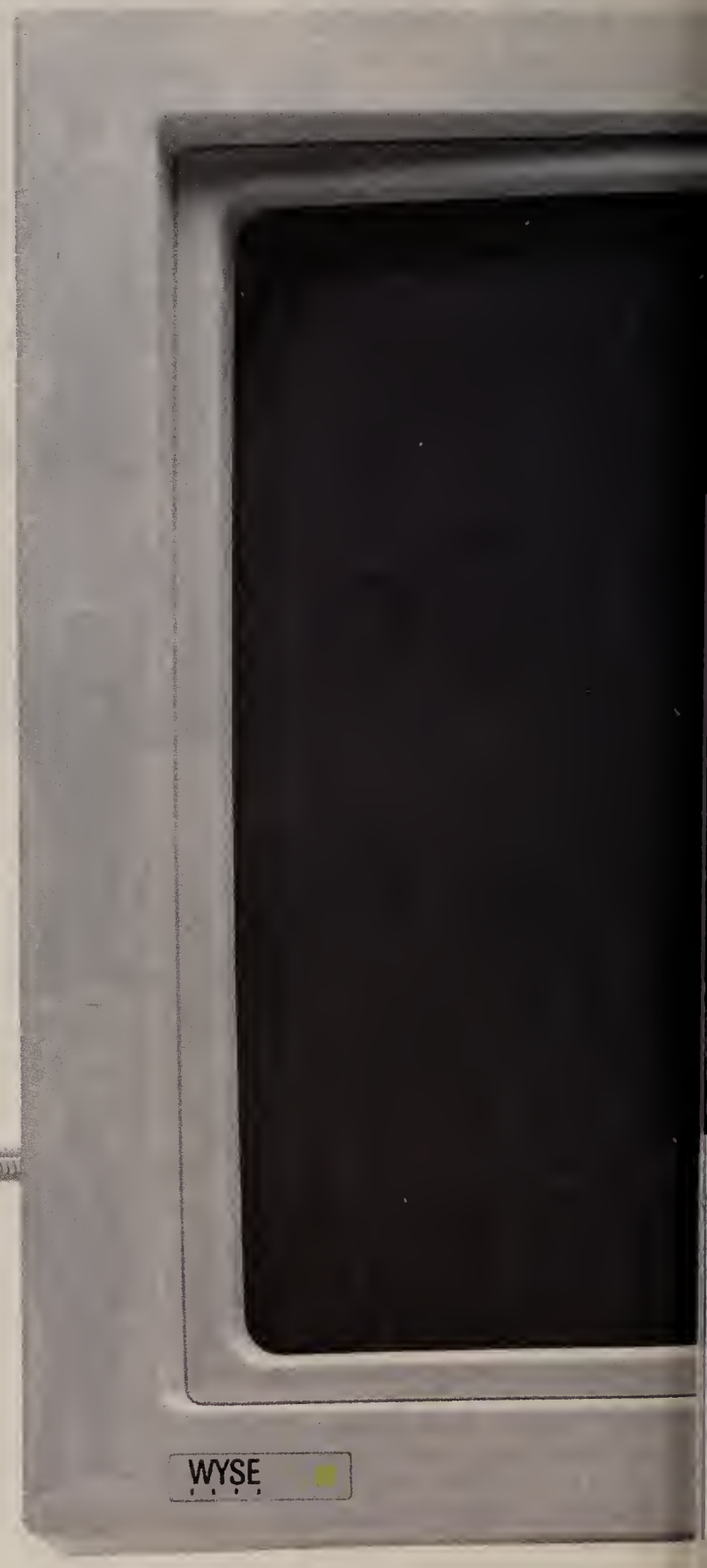
No big surprise. Wyse design has been winning over computer professionals for nearly a decade. It's won, in fact, an installed base of more than 3,000,000 terminals and PCs. Because Wyse design is also a wise investment. It delivers more features, styling and ergonomics than the competition. For less money. Witness, for example, the Wyse family of Novell-certified personal computers. The CeBIT award winner, our Model 3225, is a 25 MHz 386 that gives you more MIPS for your money than Compaq's DeskPro 386/25 or IBM's PS/2 Model 70. It's very likely the most cost effective server or CAD/CAM workstation you'll find anywhere. Likewise, our 3016SX at 16 MHz outperforms Compaq's DeskPro 386S and IBM's PS/2 Model 55. Expandable to 16MB of RAM, it's the best SX value around for the demanding user. For entry level users who plan to grow, our Model 2012i at 12 MHz 286 desktop offers 7 expansion slots, 4 drive bays, and up to 16MB RAM. It's the most expandable PC in its price range. All these Wyse systems include MS-DOS 3.3 at no extra charge.

To learn more about their winning ways, call 1-800-438-9973.

Ten of Europe's toughest critics awarded Wyse their top prize.

Over 3 million even tougher critics awarded us their business.

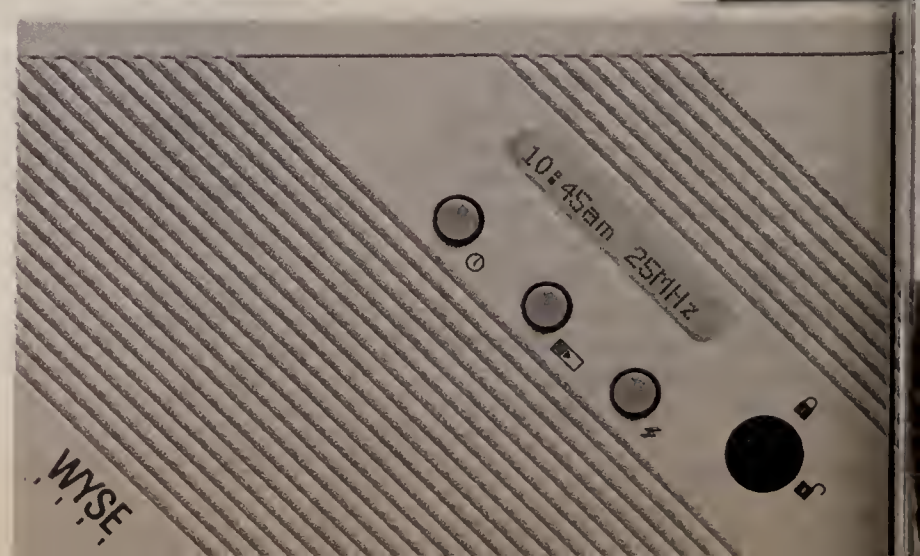
THE WORLD IS GETTING WYSE.



WYSE

1 800 GET WYSE

The Wyse Novell-certified PC family, led by our CeBIT award-winning Model 3225. Wyse PCs are among the smartest investments any business can make today.



WYSE is a registered trademark and Models 2012i, 3016SX, and 3225 are trademarks of Wyse Technology Inc.
All other trademarks are property of their respective owners.
© 1990, Wyse Technology Inc.

Netware virus threat disputed

BY MICHAEL ALEXANDER
CW STAFF

Jon David, an independent computer consultant, calls it a case of "David against Novelliath." Novell, Inc., publishers of the Netware local-area network operating system, says it's more a case of a "crackpot without a cause."

The two are locked in an escalating debate over whether a variant of the Jerusalem virus can bypass Netware read-only access, infect the server and allow nodes to write to and delete files on the server without either write or delete privileges.

"This could be totally disastrous to any organization," said Harold Highland, noted computer security and virus expert.

The Jersualem B, the most prevalent of personal computer viruses, deletes every file executed on any Friday the 13th and on all other days that the virus attaches itself to .COM, .EXE and .SYS files as they are executed and slows down the system by a factor of 10.

A Netware LAN at the Institute of Social Research at Indiana University was shut down for four days after being hit with the Jerusalem B virus in September, said Steve Gribble, systems manager at the university.

The virus appeared to bypass the read-only privilege and infected dozens of workstations in addition to the server, he said.

The viral outbreak seemed to confirm David's claims, however, Gribble said: "If you follow Novell's suggestions and recognize that file attributes can be modified, you can make the network secure, at least up to now." He attributed the outbreak more to operator error than an inherent security flaw.

In a "Netware Applications Note" to its customers this past July, Novell said Netware has security extensions to file and directory attributes that not only help protect the server from being corrupted but also protect executable files and data files from becoming infected by a virus.

"The best flag for preventing a virus from infecting an executable program is the read-only attribute," a Novell spokesman said.

Not so, David responded. Read-only is a DOS attribute and has been proven to be ineffective protection against viruses. That is precisely how the Jerusalem B is able to bypass Netware security extensions — by altering the read-only attribute to a read-write attribute, he said.

"DOS is totally vulnerable to a virus like this, but it is very possible to protect against it," said Richard King, vice president of software development at Novell. "If the files are set up properly in the right directories, you cannot infect those files."

The battle between David and Novell started last June when David received disks from a Novell distributor in Canada containing what was claimed to a variant of the Jerusalem B virus that had been retooled to specifically attack Netware.

David, along with Jay Nickerson, president of On Disk Software, and Greg Drusdow, then president of Netware Users International, ran tests at Novell sales offices in Paramus, N.J. David said that the tests confirmed that the virus gave nodes privileges to write to the server and delete files that the nodes had not been assigned. Drusdow and Nickerson did not return telephone calls seeking comment. However, Drusdow corroborated David's assertions in an article in the September-October issue of *Netware Connection*, a user group publication.

Lack of enthusiasm

David said that he also notified Novell officials, "whose response was less than enthusiastic."

Novell's software engineers "spent considerable time and money trying to replicate the problem," King said. "A disassembly of the virus did not uncover any Netware-specific knowledge; it is just a DOS virus. We were unable to confirm that you could bypass any network security."

Still, concerned Novell officials flew David out to Novell's headquarters in Provo, Utah, in August to see if he could duplicate the infection.

When he failed using the same configuration as the one in Paramus, "that is when David began to lose his credibility," King said.

David maintained that Novell must have somehow altered the software to prevent his replicating the tests in an effort to cover up the system's security loopholes.

"There are a million Netware users out there, and potentially all are at risk," David said. "Novell should be investigating this, not stifling it."

Instead, David said he has received a letter from Novell's corporate counsel. Based on the language of that letter, he said it seems that, "if I don't shut up, they're going to sue my butt off."

King said that, as a paid consultant, David had an implicit agreement to maintain confidentiality on work he did for Novell. Since David's claims were unjustified, King said, he asked Novell's corporate counsel to insist David refrain from making negative comments about Netware.

Standard developed to unite EDI with X.400

BY ELISABETH HORWITT
CW STAFF

GENEVA — A draft standard for integrating electronic data interchange (EDI) with X.400, allowing business partners to use the same standardized electronic "envelope" to exchange both EDI documents and electronic mail messages, is expected to be approved by the end of the month.

The X.435 standard, being reviewed by a Consultative Committee for International Telephony and Telegraphy (CCITT) study group, would potentially save a lot of cost and trouble for companies that have to set up a different set of protocols for EDI exchanges with each of their business partners, and often maintain a separate network system for E-mail, according to David Taylor, vice president and director of interenterprise systems at Gartner Group, Inc.

The standard would enable such users to support interenterprise EDI exchanges on their existing corporatewide E-mail network, he added.

More than meets the eye

"This is significant because when one company has a business relationship with another, that relationship is more than exchanging purchase orders and invoices; it also includes lots of messages," Taylor said.

A recent Gartner Group survey, conducted through interviews with the Stamford, Conn., research firm's customer base, found that "for every EDI message sent, from five to 10 other types of communication also took place, such as calling up to make sure the message or file got there," Taylor said.

"If you're going to have a business relationship that consists of a lot of documents," Taylor said, "why not use the same transport network to send other related messages, at the same time if possible?"

Another advantage of wrapping EDI inside X.400 is that EDI users then have access to the message management capabilities the E-mail standard offers as well to the capabilities of the CCITT X.500 directory standard, Taylor said.

The lack of such amenities "was fine as long as only 10 or 20 companies were doing EDI, but now we see about 12,000 companies doing it, with the number of EDI systems over 10 at some large companies," he added. "It's becoming difficult to keep track of which system receives what," particularly when the same documents are being broadcast to more than one destination or through intermediate nodes, Taylor said.

Already an X.400 user, Du Pont Co. "envisions in the future moving a lot of EDI transactions over X.400, but that is years away in the future because trends show that it takes that long for vendors to deliver compliant software and go through conformance testing," said Gordon Preston, Du Pont's E-mail manager.

Du Pont will also have to wait "for the people we trade with over EDI to have the X.400 capability," Preston said. He predicted that it will take two years for the standard to become commercially viable but added that "it will greatly simplify everyone's environment and greatly reduce the cost of EDI" to have one exchange protocol instead of several.

Not-so-distant future

Taylor predicted, however, that users would not have to wait long for X.435-compliant products to start appearing. Several vendors that now serve on the CCITT study group have been keeping pace with the standard's development in their own products and plan to announce such offerings within six months after the standard is approved, he said.

AT&T, Digital Equipment Corp., IBM and major value-added network vendors now serve on the committee. Both DEC and AT&T now provide proprietary methods for wrapping EDI documents inside X.400 and plan to migrate to the standard, Taylor said.

Checking the cost of checking

Software shortens check processing path

BY GARY H. ANTHES
CW STAFF

The Federal Reserve System and two trade associations are testing new software this monththat is intended to significantly reduce the cost to banks and corporations of processing paper checks.

Assisted by the National Automated Clearing House Association (NACHA) and the National Association for Check Safekeeping, the Federal Reserve will send 20,000 specially encoded test checks through the national check clearing system.

Checks with the digit 3 in the 44th position of the magnetic ink character recognition line at the bottom of the check will be earmarked by the system for "truncation," which means the paper check will not travel beyond the bank of first deposit.

Checks normally flow from the bank of deposit to the paying bank back to the check writer in a slow and expensive process. Truncated checks will instead trigger the creation of an Automated Clearing House file that can be transmitted instantly and at low cost.

An official at NACHA said the test is the first step in a more extensive pilot project to begin next spring.

She said the pilot is expected to show reduced check processing costs and faster flow of payment information. Corporations should eventually see lower bank fees and check storage costs, she said.

The Arizona Clearing House Association is also involved in the pilot project, and it is working with five credit unions that will issue consumer and rebate checks eligible for truncation in that state.

THE PILOT IS expected to show reduced check processing costs and faster flow of payment information. Corporations should eventually see lower bank fees and check storage costs.

According to NACHA, the Automated Clearing House system processes more than 1 billion transactions per year for more than 15,500 financial institutions serving more than 100,000 corporations.

NACHA invites groups interested in participating in the pilot project to call Karen Lyter at 703-742-9190.

Hewlett-Packard delivers on FDDI promise

BY JOANIE M. WEXLER
CW STAFF

PALO ALTO, Calif. — Hewlett-Packard Co. has said it is the first to fully deliver on a Fiber Distributed Data Interface (FDDI) multisourcing agreement struck over a year ago by a trio of big-name vendors.

HP, Siemens AG and AT&T shook hands in mid-1989 [CW, Aug. 21, 1989] to ship in volume FDDI transceivers that conform to a de facto standard that builds on the formal standard sanctioned by the American National Standards Institute (ANSI).

The agreement is intended to allow vendors of FDDI products, such as network adapter cards, workstations, bridges and routers, to have several supplier sources for volume quantities of their optical components.

The ultimate goal of the deal is reportedly to spur competition and lower prices for would-be users of the costly 100M bit/sec. FDDI local-area networks.

Feasible strategy

"HP is an established vendor for supplying optical components for other networks, such as Ethernet," commented Richard Mack, an analyst at Kessler Marketing Intelligence in Newport, R.I., "so the strategy is feasible. Sharing specifications with AT&T and Siemens also tells computer manufacturers that if they can get the same part from several sources, they and their customers are not going to be left in the lurch if one company drops the product line or goes out of business."

Transceivers convert electrical signals to optical signals and vice versa. FDDI LANs, which run at 100M bit/sec. over fiber-optic cabling, support up to 500 stations on a single network, with each station requiring at least one transceiver. The transceiver is reportedly the most costly component of an FDDI network adapter. The HPBR-5125 transceiver lists for $550 in quantities of one to nine, with volume prices negotiable, according to the company.

Efforts are also under way by two ANSI working groups to create lower-cost 100M bit/sec. networking. They include relaxing the performance specifications of the optical components and running the high speeds over twisted pair.

The current Physical Media Dependent (PMD) component of ANSI's FDDI standard defines optical performance and guarantees interoperability among products at the physical layer.

The HP-Siemens-AT&T plan is to create a de facto standard that takes PMD a step further and addresses PMD implementation. This allows vendors to also standardize on a "footprint" — the width and depth of the package and number of pins for a standardized "plug-in" of the components onto a board.

"We felt that with vendors out there creating their own proprietary footprints, costs weren't coming down because volume of any one implementation couldn't come up," explained Nate Walker, marketing section manager at HP's Optical Communications Division.

Mack countered, "I don't see anyone delaying a purchase to wait for something to come down in price — if they really want it. For example, people who need more [random-access memory] just go out and buy it, regardless of what it costs. FDDI is no longer just a buzzword technology; now that it's recognized as a standard, it has become really important to information services people."

According to Walker, seven manufacturers are currently committed to supporting the de facto standard, but HP is the first to deliver compliant transceivers in volume.

Booker

CONTINUED FROM PAGE 61

Even within the U.S. forces, there have been some problems with C3. Following the Grenada operation, reports surfaced that the four branches of the U.S. armed forces had trouble talking to one another. There was even a widely circulated — although never confirmed — story of a soldier who, unable to get through to his command via radio, dialed back to the U.S. mainland from a pay phone with an AT&T calling card to request air support.

Add to all this the fact that some of our Desert Shield allies are very recent friends, cooperating in the Gulf for their first joint military exercise with a Western force, and the potential for a Tower of Babel looms.

In the biblical story, God, angered by Nimrod and his people for their arrogance in trying to build a mighty tower that reached to Heaven, goes among the people, "confounding their language that they may not understand one another's speech" and scattering them throughout the world.

At the very least, miscommunication and accidents on the battlefield are more likely because of the mixed force now gearing up for war in the Gulf. Let us hope war is averted because diplomacy — the preferred method of communicating between nations — prevails.

Booker is *Computerworld's* Chicago bureau chief.

"That reminds me, now that we've managed to network everything, who's going to manage our network?"

Deciding on how to manage a network with different devices, systems and architectures can be an abstract proposition for any company.

Consider then, for a moment, this bold statement:

No other company helps companies design, set up and manage their multivendor networks better than IBM.

Surprised?

Then ponder this as well. IBM's NetView® family of network management software is unsurpassed in helping you better control, monitor and automate the flow of information in your company.

Graphically, all from one point. 24 hours a day.

Whether your equipment is IBM or not.

NetView manages OSI systems and handles your voice and data applications.

What's more, NetView has been

NetView is a registered trademark of International Business Machines Corporation. Copyright 1990 IBM Corporation.

Protolyzer combines LAN analyzers and monitors

BY JIM NASH
CW STAFF

An almost unknown start-up company is making a run at the leading makers of network analysis and monitoring equipment by aiming at their Achilles' heel: user interfaces.

Protools, Inc. in Beaverton, Ore., a spin-off of consulting firm DWB Associates, began shipping its Protolyzer in September. Billed as a cross between local-area network analyzers and monitors, the hybrid is aimed at network administrators who only rarely need to analyze actual packets.

According to consultant Craig Burton, the company is banking on people needing to know less about what is in each packet than the broader view of what is happening on the network in general. Burton is a principal at Clarke Burton Corp. in Salt Lake City.

And, indeed, some LAN managers are willing to trade reams of data for ease of use. "Everybody's got their differentiating points," said Ben Ruiz, senior director of advanced engineering at Lansystems, Inc. "Network General can decode protocols superbly."

Ruiz, in the LAN systems integrator's New York office, said Protolyzer's differentiating feature is its graphical interface, which he said was a "breeze" to use.

The Protolyzer is based on Microsoft Corp.'s OS/2 Presentation Manager, runs on a 32-bit engine and costs about $15,000. It analyzes protocols including Microsoft's LAN Manager, Banyan Systems, Inc.'s Virtual Networking Software, Novell, Inc.'s Internet Packet Exchange and Transmission Control Protocol/Internet Protocol. Protolyzer straddles the fence between analyzer, which has a relatively modest analysis of protocols, and monitor, with its built-in compiler and report generator.

Ruiz said he would like to replace the single Network General Corp. Sniffer analyzer that Lansystems shuttles around its offices with Protolyzers. He expressed reluctance about doing so before Protools beefs up its protocol decoding abilities.

Jeff Erwin, president of Protools, said that OS/2 is the only operating system with the capacity to run Protolyzer, given the tool's multithreaded nature. "Users said they needed a real operating system, not something pasted on top of DOS."

It is that multitasking capability, said Steve Waldbusser at Carnegie Mellon University in Pittsburgh, that allows him to "scope in on several protocols or on several types of packets within a protocol" simultaneously. That way, said Waldbusser, manager of network development at the university, he can better track his 140-subnet network.

"You can have multiple virtual analyzers running at the same time," Waldbusser said.

Eric Cox, a network engineer at Compaq Computer Corp. in Houston, said he tested a beta version of Protolyzer and was impressed. Cox said he used it to record and play back activity on a LAN setup to test Compaq components. The result was a game film of sorts that helped determine how components reacted to different stresses.

> PROTOLYZER "IS LIMITED by running only OS/2. We would be buying more of the product if it were running Unix or even DOS."
>
> STEVE WALDBUSSER
> CARNEGIE MELLON UNIVERSITY

However, Waldbusser pointed out, Protolyzer "is limited by running only OS/2. We would be buying more of the product if it were running Unix or even DOS." And, he said, "the price means it won't be on everybody's desk. We couldn't afford to put one Protolyzer on each subnet."

"I know this sounds shallow, but [the employees who need to oversee networks] are not exactly packet-accounting engineers," said Cheryl Currid, director of applied information technology at Coca-Cola Foods in Houston.

The Protolyzer's icons, Currid said, make it easier for nontechnical employees to understand the data it produces. "They give an old tool a face-lift," Currid said. The "old" face is the "old, ugly character interface" that intimidates users.

Currid said the interface alone might be enough to make Protolyzer a big success, despite its limitations. Its competitors, Sniffer and Novell's Lanalyzer, have proven easy to use but not easy to understand, she said.

Burton said the company is moving in the right direction with its "commitment to making these things more user-intuitive instead of gearing it for the technician." Noting Network General's lack of easy-to-discern icons, Burton said users might be willing to give up Sniffer's detailed analysis for less daunting graphic interfaces.

enhanced, making it easier than ever to use, monitor problem alerts, and "talk" with IBM and non-IBM systems.

Of course, there are other attractive features of NetView to consider.

Like how it helps you better manage your company's voice and data information.

The way it cuts down network costs.

Or how it enables you to finally turn your network into the profitable corporate resource it was meant to be.

Which, all things considered, can paint a pretty picture for your company's future.

To find out how IBM can help you make the most of your network, call your IBM Marketing Representative.

IBM®

THE POWER OF BELIEF: #3 in a series

Free trade always sounds good, but sometimes you have to fight for it.

In a Fair-Trade world, every consumer and company could buy the world's best quality product at the world's best price. ■ This belief guides Motorola's efforts worldwide. Our success in Japan is the product of 30 years. First as teacher, later as student, only now as friendly competitor and supplier.

■ We have learned that

Motorola recently introduced the JSMR® trunked two-way radio system and the first trunked portable two-way radio to Japan.

Winner 1988 Malcolm Baldrige National Quality Award

management on both sides must play a role. We build unique products for each market, and strive to make the best in the world. ■ We fought for the right to sell radio pagers, cellular telephones and two-way radios in Japan. Motorola benefits. So do its customers. So do the Japanese consumers who use Motorola's products. Nobody on earth succeeds alone.

Motorola's pagers, like this one manufactured in Boynton Beach, Florida, were the first pagers imported to the Japanese paging market.

Building On Beliefs

Ⓜ, Motorola, Bravo and JSMR are trademarks of Motorola, Inc., ©1989 Motorola, Inc.

MOTOROLA

GSA

FROM PAGE 61

failure to protect confidential information in computer systems generally and in particular for failing to comply with provisions of the Computer Security Act of 1987.

At one recent hearing, Congress threatened legal action against agencies that fail to implement their existing security plans.

The Blacker systems will be used for access control and for encryption of classified data, and Cipher X-5000 from Technical Communications Corp. will be used for encryption of unclassified data.

That is an interim approach, said Michael Corrigan, assistant commissioner in the GSA's Office of Telecommunications Services. He said the NSA is augmenting the Government Open Systems Interconnect Profile to allow communications protocols to make subroutine calls for encryption and key management from within the host operating system.

That will eliminate the need for the Blacker front ends and will mean that all data sent by the host will be encrypted automatically. "There's not much traffic that doesn't need encryption," he said.

The GSA will maintain a computerized access-control list that determines which hosts can talk to which at what levels of security. For example, it might say that a certain IBM Personal Computer at the U.S. Department of Energy in New Mexico may pass secret data to a Wang Laboratories, Inc. minicomputer at the Department of State here.

That would require the GSA system to assign both hosts the same keys for encryption and decryption based on an agreement between the two user agencies.

The GSA hopes to have its encryption and access control service available on a limited basis in one year and on a full production basis in two years.

NEW PRODUCTS

Local-area networking hardware

Network Computing Devices, Inc. has recently announced the NCD15b, a 15-in. monochrome X Window System-based terminal that features 1,024- by 800-pixel resolution and a noninterlaced screen.

The product includes a 16-bit processor for driving text, windowing applications and two-dimensional graphics and 2M bytes of dynamic random-access memory.

The NCD15b is priced at $1,495.

Network Computing Devices
350 N. Bernardo Ave.
Mountain View, Calif.
94043
(415) 694-0650

Digital Communications Associates, Inc. has begun shipping a token-ring local-area network hardware adapter that supports Novell, Inc. Netware 286 and 386, IBM's PC LAN Program and its own 10Net Plus program.

Irmatrac Token-Ring Adapter/Convertible ($895) includes ring interface modules that can support 4M- or 16M bit/sec. token-ring LANs from a single adapter. The company plans to add software drivers that will enable the product to support Microsoft Corp.'s LAN Manager and other OS/2-based products. The drivers are scheduled to be available by first-quarter 1991.

DCA
1000 Alderman Drive
Alpharetta, Ga. 30202
(800) 241-4762

Gandalf's Mini MAU *lets users connect to 10Base-T LANs*

Gandalf Data, Inc. has announced a miniaturized 10Base-T media access unit transceiver that permits devices to be directly connected to 10Base-T local-area networks via unshielded twisted-pair wiring.

The Mini MAU transceiver enables users to connect to 10Base-T LANs by using IEEE 802.3 or Ethernet network interface cards. It can be connected to the 15-pin attachment of an IEEE 802.3 or Ethernet network interface card.

The product is available for $189.

Gandalf Data
1020 S. Noel Ave.
Wheeling, Ill. 60090
(708) 459-9348

Western Telematic, Inc. has introduced a peripheral and data sharing system designed to enable personal computer users to transfer files and network printers, plotters, modems or facsimile machines.

Lasernet Multi-Link includes eight concurrent serial and four parallel ports. Up to 32 Multi-Link units can be connected via a data-link port. A standard unit equipped with 256K bytes of field-expandable memory costs $1,195. The product is slated to be released next month.

Western Telematic
5 Sterling
Irvine, Calif. 92718
(714) 586-9950

Asante Technologies, Inc. has announced two Ethernet products designed for Apple Computer, Inc.'s Macintosh IISI and Macintosh Classic systems.

The Maccon+ 30i is a small Ethernet card that fits into the IISI's Direct Slot 030 bus without requiring an extender card or any additional hardware.

It is available in two versions: one that contains thick and thin ports and another equipped with thick and twisted-pair ports. Both models are priced at $495.

The EN/SC ($595) is an external small computer systems interface box that provides Macintosh Classic users with thick, thin or twisted-pair Ethernet connections.

It is scheduled to be available next month.

Asante Technologies
405 Tasman Drive
Sunnyvale, Calif. 94089
(408) 734-4844

Local-area networking software

Synexus, Inc. has announced a software package designed to protect Novell, Inc. Netware servers in the event of a power failure.

Pwrmon can work with any uninterruptible power supply (UPS) system equipped with an RS-232 interface. It runs in a file server's operating system and communicates with a UPS via the server's RS-232 port.

The product is priced at $175.

Synexus
3 Osage Road
Canton, Mass. 02021
(617) 828-9390

Atlantix Corp. has announced a software package designed to run on an Intel Corp. 80386- or I486-based personal computer running The Santa Cruz Operation's Unix operating system.

Atlantix Axcess enables a standard Unix-based PC to operate as a network server that supports new or existing local-area networks. It provides users with a Unix-based, Microsoft Corp. LAN Manager-compatible LAN that supports Unix, Xenix, DOS, OS/2 and Apple Computer, Inc. Macintosh machines.

The product costs $4,595 for a 32-user version.

Atlantix
5401 NW Broken Sound Blvd.
Boca Raton, Fla. 33487
(407) 241-8108

Emulex Corp. has announced Version 2.1 of its multiprotocol software package designed for its family of local-area network communications and printer servers.

The upgraded release includes enhanced Transmission Control Protocol/Internet Protocol features and provides Serial Line Internet Protocol point-to-point connectivity.

The product can be used on the Emulex Performance 4000 line of terminal servers, the Emulex 8000 fault-tolerant communications server and the Performance 3000 printer servers. It is priced at $500, and volume shipments are scheduled for the first quarter of 1991.

Emulex
3545 Harbor Blvd.
Costa Mesa, Calif. 92626
(714) 662-5600

Network management

David Systems, Inc. has introduced David Expressview, a software system designed to provide users of its Expressnet Intelligent Concentrators, workstations, bridges or routers with single-workstation network management capabilities.

The product uses in-band Simple Network Management Protocol signaling to enable users to manage a network from one management station. It runs under Microsoft Corp.'s Windows 3.0 on an Intel Corp. 80386- or I486-based IBM Personal Computer AT or compatible. Expressview is slated to be available at the end of the month.

The price of a single Ethernet application is $1,495.

David Systems
701 E. Evelyn Ave.
Sunnyvale, Calif. 94086
(408) 720-8000

Hewlett-Packard Co. has introduced HP 495X PC Utilities Software, a set of application programs designed for use with its wide-area networking protocol analyzers.

The programs enable users to remotely control and analyze test data from a central site without using dedicated protocol analyzers at central and remote test sites, the vendor said.

The product is included with the HP 4951C ($3,980), HP 4952A ($7,040) and HP 4954A ($16,470) WAN protocol analyzers. Owners of any HP WAN protocol analyzer can purchase HP 495X PC Utilities Software as a stand-alone product for approximately $250.

HP
3000 Hanover St.
Palo Alto, Calif. 94304
(800) 752-0900

The Wollongong Group, Inc. has announced Management Station Release 2.0, a software product that is based on the Simple Network Management Protocol, which enables network managers to monitor and control complex internetworks.

The product includes a set of tools, including an X Window System-based Open Software Foundation Motif graphical user interface, a network map and an interface to Ingres Corp.'s Ingres relational database management system.

A single-user license is priced at $10,000, regardless of platform.

The Wollongong Group
1129 San Antonio Road
Palo Alto, Calif. 94303
(415) 962-7100

Zaron Software, Inc. has announced LAN Watch, a system designed to provide personal computer and network security while running on IBM Personal Computer ATs, Personal System/2s or compatibles.

The product can be used to prevent unauthorized downloading or copying of programs to floppy disks, PCs or networks. A file server version can monitor up to 99 connected workstations, according to the vendor.

LAN Watch is priced at $95, and the file server version costs $495.

Zaron Software
13100 Dulaney Valley Road
Glen Arm, Md. 21057
(301) 592-3334

Tekelec has announced the Chamelan 100, a test system designed to provide complete monitoring and statistical analysis for high-speed Fiber Distributed Data Interface networks.

The product can be used to continually test and diagnose problems and evaluate performance, regardless of the type of traffic loads on the network, according to the vendor.

The Chamelan 100 is scheduled to begin shipping in the first quarter of 1991. Pricing starts at $36,000.

Tekelec
26580 W. Agoura Road
Calabasas, Calif. 91302
(800) 835-3532

Gateways/ Bridges/Routers

Cisco Systems, Inc. has introduced the Cisco Protocol Translator, which was designed to allow intercommunication among networked machines via Transmission Control Protocol/Internet Protocol X.25 and Digital Equipment Corp.'s Local Area Transport (LAT) protocols.

Pricing starts at $7,925 for a LAT/TCP translator with an Ethernet interface. An LAT/TCP X.25 version can be purchased with two types of serial interface options, depending on type of line speed required.

A unit that provides maximum serial communication of 64K bit/sec. costs $9,400. A 4M bit/sec. version costs $10,125.

Cisco Systems
1525 O'Brien Drive
Menlo Park, Calif. 94025
(415) 326-1941

"At St. Jude, we're caring for children with cancer. We need a network that can care for itself."

"Only BANYAN could have done it."

From an interview with Albert Herrington, St. Jude Children's Research Hospital.

"We don't want a big network administration staff. We're a research hospital dedicated to catastrophic childhood diseases, and that's where the money goes."

What problems did you face?

"The worst problem was the conglomeration of hardware to be tied together. Everything from PC ATs to DEC VAXs and an IBM AS/400. That, and continuous moves as we remodel and expand the facilities."

Whose network operating software did you evaluate?

"Everyone's, it seems. IBM's, AT&T's, Novell's, Banyan's and 3Com's."

How does St. Jude feel about choosing Banyan's VINES® now?

"We're extremely pleased. VINES' StreetTalk® feature has made moving people easier because you can reach them anywhere, anytime on the network without having to know their specific server. And since VINES is so reliable, we can concentrate more time on application development and helping our users take full advantage of the network."

Banyan's VINES network operating software can make organizations of all sizes more productive, while minimizing operating costs. For a further description of St. Jude's networking problems and real-life solutions, write or call us at 800-828-2404 (in MA 508-836-2828).

BANYAN®™

Networking. Without limits.

Copyright © 1990 Banyan Systems Incorporated, 120 Flanders Road, Westboro, MA 01581

AccessiBull

However you go—OS/2 or UNIX systems—Bull Servers
can take you beyond the LAN.

KNOW BULL

Copyright © Bull HN Information Systems Inc. 1990 *UNIX is a registered trademark of AT&T

PC Services

Network File System

PC-Interface

PC-Interface/SMB

LAN Manager

Data Base Services

ORACLE

INFORMIX

Communication Services

Wide and Local Area (SNA, TCP/IP, OSI)

Bull OS/2 Servers

3Server/500

Up to 16 Megabytes memory

Up to 6 Gigabytes internal disk storage

X.25 Mail Gateway

X.400 Internetworking

Bull DPX/2 line of UNIX Servers

100 Family
200 Family
300 Family
500 Family

All UNIX System V

Symmetrical multi-processor support

Up to 512 Megabytes memory

Up to 40 Gigabytes internal disk storage

Bull can integrate your PC LANs at the work group level and the enterprise level too.

Bull offers OS/2 and UNIX* work group servers—as well as the products and experience to make them work in a wide variety of networks, including SNA.

For years, major corporations and government agencies worldwide have entrusted Bull with their network needs. We have developed real world solutions that integrate the desktop, the work group, and the enterprise.

Bull is the one-stop resource. We meet your LAN and WAN requirements with network design, installation and support, custom applications development, and system integration services.

For more information on Bull's server technology, call 1-800-233-BULL, ext. 210. In Canada, 1-800-268-4144.

Worldwide Information Systems

Bull

THE CODEX 3380 19.2KBPS MODEM CAN SAVE ENOUGH ON LINE COSTS TO PAY FOR ITSELF.

If your throughput requirements keep increasing, but you think moving up to 19.2Kbps costs too much, here's good reason to think again:

A Codex 3380 19.2Kbps modem costs only $2,995 (quantity one). If your line costs are $12,000 a year, a pair of Codex 3380s pay for themselves in as little as six months. The more lines you use, the more reason to upgrade right away.

COST OF 2 CODEX 3380s	÷	ANALOG-BASED LINE COST	=	PAYBACK PERIOD
$5,990	÷	$12,000	=	.5YR OR 6MOS.

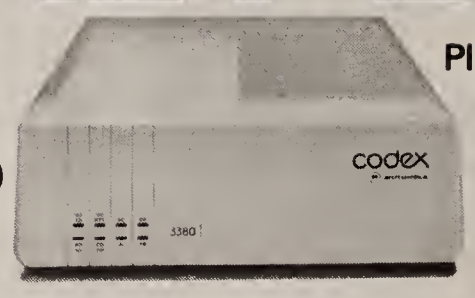
THE MOST VALUABLE FEATURE OF ALL IS CODEX QUALITY.

$2,995 for a Codex 3380 buys you more than just line savings. You're buying Codex performance and reliability. Which means you get 19.2Kbps throughput all the time, not just at peaks. There's an optional feature that provides automatic dial restoral when line conditions degrade. And you get our priority on-site one year warranty.

To learn more, send in our coupon or call 1-800-426-1212 ext. 7229.

BUY THIS MODEM AND GET YOUR MONEY BACK.

Call 1-800-426-1212
ext. 7229
Or mail this coupon to:
Codex Corp., Dept M2-380
20 Cabot Blvd.
Mansfield, MA 02048



Please send me information about how quickly the Codex 3380 19.2Kbps modem pays for itself.

codex
MOTOROLA

Name_____

Company_____

Address_____

City_____ State_____ Zip_____

I currently plan to purchase _____ modems within the next _____ months. ☐ Please tell me about your quantity discounts.

© 1990 Codex Corp., Motorola and Ⓜ are trademarks of Motorola Inc. Codex is a registered trademark of Codex Corp.

MANAGER'S JOURNAL

EXECUTIVE TRACK

Donald G. Liedtke has been appointed chief information officer at **Valcom, Inc.**, a nationwide chain of franchised and company-owned computer stores based in Omaha.

Liedtke formulates and supervises information strategies to facilitate communications between Valcom and more than 300 dealers in 46 states. He is a member of the firm's executive management committee.

A 15-year information systems veteran, Liedtke has been vice president of corporate product development at First Tennessee Bank for the past three years. Before that, he was president and owner of Don Liedtke, Inc., an IS management consulting firm specializing in the air freight and distribution industries.

.....

William E. Kelvie has been named senior vice president and chief information officer at the **Federal National Mortgage Association (Fannie Mae)** in Washington, D.C.

Kelvie was formerly a senior partner at IS consultancy Nolan, Norton & Co. He opened the firm's New York office in 1986 and served as managing principal there, developing IS strategies for investment and money center banks in the U.S. and Europe. Before that, he designed and implemented large applications at The Dexter Corp. and The Travelers Corp.

As Fannie Mae's first CIO, he will lead the congressionally chartered company's effort to use advanced technology to improve service.

Kelvie holds a master's degree from Trinity College.

.....

Gary S. Lynch, formerly vice president and manager of corporate information security at Prudential-Bache Securities, Inc. has been appointed Northeast regional sales manager at **Pyramid Development Corp.**, a West Hartford, Conn.-based vendor of personal computer-based computer security software. Lynch was previously manager of data security at Martin Marietta Data Systems in Orlando, Fla.

The hidden costs of open systems

Managers find that freedom to choose brings new responsibilities and up-front costs

BY J. A. SAVAGE
CW STAFF

When service stations were *service* stations, many drivers did not even know how to work a gas pump. With self service, the price of gas dropped, but drivers had to learn to pump gas, find the crankcase and carry a tire pressure gauge in the glove compartment.

As information systems managers begin to adopt open systems in this era of not quite standards, they too find that full-service vendors no longer fully service the systems. The responsibility of maintenance — and much more — is now falling on their shoulders.

"Open systems gives customers freedom of choice, but the price of freedom is responsibility," says David Ticoll, director of emerging technologies at DMR Group, Inc., a Montreal-based consulting firm that recently completed in-depth interviews with 100 IS employees in organizations with open systems.

In taking on more responsibility, managers cite several common points: They learned to go for the vendor's jugular in demanding support by making veiled threats to switch suppliers. They also have to spend more time on homework, and more money on training.

"It does complicate things," says Charlie Hamlett, who is the vice president of IS at La Quinta Motor Inns, Inc. in San Antonio. "In the vendor-dependent world, you have to pay for that support, but eventually, you get a body out there to solve problems. In the generic world you get, 'You're on your own, Jack.' "

Peter Sibbald

Four Seasons Hotels' McDowell: *The onus is on the open systems customer.*

La Quinta was previously in the hands of vendor Texas Instruments, Inc., with its DX 10 hardware and proprietary operating system.

Most IS managers who have opted for open systems conclude that the management headaches are worth the cost savings and technology benefits. But they do feel strongly that their colleagues should be aware of the additional training and maintenance needs before taking the inviting open systems plunge.

"It's much more than Unix," says Geoff McDowell, manager of technology and research at Four Seasons Hotels Ltd. in Toronto. "It includes standard communications protocols, standard ways of accessing databases, standard graphical user interfaces and standard development and productivity tools."

To the extent that open systems vendors can answer basic questions such as configuration, they have been reasonably supportive, McDowell says. "But the onus really falls back on us, the customer," he says.

McDowell formerly had support from a turnkey package based on Data General Corp.'s Nova hardware from the 1960s. He said that the first changeover to open systems, with Intel Corp. 80386-based desktop systems and Hewlett-Packard Co. minicomputers, was "traumatic."

Continued on page 84

Risk management: As easy as 1 through 10

BY MITCH BETTS
CW STAFF

You've been through dozens of meetings like this. The manager of a big software development project stands in front of a flip chart and drones on about the project's monthly status report, carefully accentuating the positive and glossing over the problems.

This takes up 50 mind-numbing minutes of the hour-long meeting, leaving the information systems executive only 10 minutes to ask probing questions and find out the *real* status of the project.

But there is a better way, according to Barry W. Boehm, an authority on software risk management. At a recent lecture sponsored by the National Institute of Standards and Technology, Boehm said that one of the most effective ways to monitor software projects is to convert the typical "progress review" into a risk-management meeting, which focuses on the Top 10 items that could jeopardize the whole project.

"Focus the review on things that can really make a difference and the manager can really do something about," said Boehm, director of information science and technology at the Defense Advanced Research Projects Agency in Arlington, Va.

He said the risk factors tend to fall into the following categories: personnel shortfalls; unrealistic schedules and budgets; developing the wrong software functions or interface; a continuing stream of requirements changes; and real-time performance shortfalls.

Software developers should calculate the risk exposure for each item, using the following equation: risk exposure equals probability of unsatisfactory outcome times loss from unsatisfactory outcome. For example, if a software feature has a 20% chance of failure and that failure would totally ruin a $20 million scientific experiment, the risk exposure is $4 million.

Even if the loss cannot be stated in dollar terms, users can score the items on a scale of one to 10 so that the IS manager can give attention to the items with the highest risk exposure, Boehm said. Unfortunately, many managers instead focus on minor programming errors that have a high probability but low losses, he said, neglecting the portions of the software that could produce a catastrophe.

HP's RISC puts unprecede
HP's NewWave Office puts

nted power within your reach. it within everyone else's.

With most computers, you have to give up power to save money. And whatever level of power you settle for, it's usually difficult for anyone but an expert to use.

Hewlett-Packard has a better way.

Our full line of RISC-based computers offers a wide range of power levels. At prices that let you base your choice on performance rather than budget.

And when you add HP's NewWave Office system, people can put this power to use quickly and easily from their desktop PCs. Which leads to the kind of productivity computers have always promised, but rarely delivered.

37 computers give you the choice of power you need.
That's a pretty impressive number of RISC systems. But the numbers that will impress you more are right on your bottom line. Our RISC minicomputers start at under $15,000. Our high end of the power spectrum gives you mainframe performance at minicomputer prices.

Of course, the initial price is only one part of the equation. Since RISC architecture is simpler, it's fundamentally more reliable. And that means lower maintenance and service costs. In short, a dramatically lower cost of ownership.

If you think you can get these advantages from DEC and IBM, think again. DEC doesn't offer a complete range of RISC systems. And IBM only offers RISC technology in workstations.

The competition can't offer you the same level of software compatibility, either. If you went with IBM, you'd have to migrate across different families to even approach the range of computing power we can provide in a single compatible HP systems family.

Finally, power that people find easy to use.
That's the whole idea behind HP NewWave Office system. Its unique object-based technology lets all of your information resources work together. And gives users a consistent interface across mainframes, minis, workstations and PCs.

It also integrates information from your current applications and integrates existing DOS applications, regardless of the vendor. IBM OfficeVision doesn't. What's more, HP NewWave Office is based on industry-standard networking, and runs on HP's UNIX® system-based computers, HP 3000 systems and OS/2 operating systems.

Beyond this, HP NewWave Office incorporates an extraordinary new "agents" capability. Agents can handle a wide range of sophisticated tasks. For instance, they can automatically gather data, analyze it, generate a report and distribute it.

The net result of HP's approach is this: Applications and information are right where people want them—at their fingertips. Which puts real power where it's needed most. The kind of useful power you always hoped to get out of your company computer system.

Call us at **1-800-752-0900, Ext. 1477** for more information. We promise a very powerful experience for you, and for everyone else in your office.

HEWLETT PACKARD

UNIX is a registered trademark of AT&T in the U.S.A. and in other countries. © 1990 Hewlett-Packard Company NSS9014

Port Authority on tight ship

New IS director reorganizes units for efficiency and cost-effectiveness

BY MAURA J. HARRINGTON
CW STAFF

NEW YORK — After more than six months of intensive study and review of the Port Authority of New York and New Jersey's information services department, Director Wilma Horne is reorganizing the department into four separate divisions.

Horne, who came to work at the Port Authority last March from Blue Bell, Pa.-based Unisys Corp., said things were "in order" when she arrived, but they were not quite as organized as she would like them to be to run such a large operation with the necessary efficiency and cost-effectiveness.

So Horne went to work reshuffling the 270-person department to help the Port Authority's 23 other divisions run a tighter ship in these economically difficult times.

"Part of my reasons for establishing these units is to find out all of what is out there. The business units take advantage of hardware and software solutions, and some business units have gone out and bought full solutions from vendors that fit their individual unit's needs," Horne said.

"That doesn't mean that we will change those solutions," she added, "but we have to understand what is going on in each department. The challenge is to take a central resource and establish which business unit gets prioritization for certain applications or services."

Horne explained, "Our basic charter is to provide information services for all the individual business units in the most efficient and effective manner."

Charter with a mission

The charter is also not without a mission, she added. That mission, according to Horne, is "to ensure that the potential of information technology is fully and effectively utilized by the business units of the Port Authority in the achievement of their missions, strategies, business and operational objectives."

The four new divisions of the information services department, which will be developed and refined as needed during the next several months, include: applications services, telecommunications services, technology services and strategic and financial planning.

The applications services division, which was officially announced to the public late last month, was developed to take over the tasks that were formerly provided for a business unit within the Port Authority by the management/systems analysts, client consultants and systems designers and programmers, according to Horne.

This division will also act as a single point of contact between distraught users and the information services department and will provide end-user application support, project management and consultating.

An information center, which was formerly called the client services division, and a development support services subdivision will also fall under the applications services division, Horne added.

Reinhold Spiegler

Port Authority's Horne *breaks IS into four separate divisions*

The information center division will continue to be responsible for facilitating end-user computing and will maintain office information systems as well as provide end-user software support and training.

Development support services, according to Horne, will be responsible for ensuring that the tools and processes used by the divisions are appropriately selected and consistently used throughout the Port Authority to avoid overlap or redundancy in problems.

Blueprint maintenance

Development support services will coordinate, document and maintain a blueprint of the Port Authority's applications architecture for the various business units.

That department will also be responsible for all computer-aided software engineering strategies, for the quality assurance processes for all applications and for recruiting and training development staff members, according to a report written by Horne.

"From a financial purpose, we have to run the Port Authority under one budget and one division, but from a business perspective, we will assess each department and run them somewhat separately," Horne said.

Decentralization easier said than done

BY CLINTON WILDER
CW STAFF

Few can argue with the benefits of decentralized systems development — lower costs, faster turnaround and more business-responsive applications. But many information systems departments trying to get to that point are reaching the same conclusion: easier said than done.

Although moving some development to business units and smaller platforms may make infinite organizational and technological sense, some IS departments are meeting strong cultural resistance from veteran mainframe programmers and analysts. That resistance may result in increased training costs and lower morale — and put the brakes on decentralization plans.

"It's not clear that the same people doing glass-house development will want to do decentralized development; it's a very different mind-set," said Stuart Woodring, author of a report on decentralized development for Forrester Research, Inc. in Cambridge, Mass. "The staff of software development today is not necessarily the right staff to run it in the future," he said.

James River Corp. encountered initial opposition to converting the business applications at its Kalamazoo, Mich.-based paperboard packaging unit from an IBM 4300-class mainframe to Application System/400 midrange systems.

"The resistance at the front end was, 'We've always done it this way. We know these systems inside and out — why do we want to change?' " said James Miller, vice president of MIS at Richmond, Va.-based James River. Miller said about half of the employees at the Kalamazoo mainframe data center were retrained to work in the midrange environment, but the other half transferred to non-IS jobs or left the company.

At International Multifoods, Inc. in Minneapolis, Vice President of Information Services Paul Taylor credited a successful 4381 to AS/400 migration to project teams focused tightly on each business unit's applications — and a lot of retraining.

"There are three elements to being successful: the technology, how it relates to the business process and making sure we appreciate the human aspects of bringing the technology to bear," Taylor said. "Top-flight technology won't overcome difficulties in the other two; if anything, it would exacerbate the situation."

Taylor said his department carefully chose the mainframe developers for the midrange project teams. Those who participated successfully in International Multifoods' migration from Burroughs Corp. to IBM a few years ago were not necessarily selected.

"Burroughs to IBM was a substantive change but within a similar structure and environment," Taylor said. "Some of those people might not have done as well going to the midrange."

A Forrester survey of 50 companies in the Fortune 1,000 found that only 12 have successfully shifted centralized development staff out to departments or business units. More often, Woodring said, the IS department hires new programmers and analysts while reducing the central mainframe development staff through attrition.

However, that "new blood" in decentralized IS can be a problem for end users, Miller said. "The bulk of the resistance [to James River's conversion] was voiced by people who used the applications," he said. "When you bring in midrange people, the average age drops about 20 years, and all of a sudden the comfort level [for technical support] isn't there."

Cultural resistance by users also occurs when formerly decentralized development functions are centralized. CBS, Inc. in New York is consolidating its programmers [CW, Dec. 18, 1989], and Vice President of MIS James L. Halsey III said he is sensitive to the disruption.

"We will sacrifice transition time for project continuity in order to avoid damaging client relations," he said. "Clients that had their own complete IS organizations tend to be less thrilled [with the centralization]. They see an increased administrative component up front, but we have to win them over with more efficient prototyping and development."

William M. Walsh dies at 54

William M. Walsh, 54, executive vice president of the New York Clearing House Association, died of cancer on Nov. 10.

Walsh, a 1958 graduate of Franklin and Marshall College, joined the Clearing House in 1983 as senior vice president and director of data processing. He was promoted to executive vice president this past May.

Walsh *specialized in funds transfers*

In his most recent position, Walsh was responsible for overseeing paper-based exchange and settlement processes averaging $33 million daily. He also supervised two electronic-funds-transfer systems, the Clearing House Interbank Payments System and the New York Automated Clearing House, which are responsible for the exchange and settlement of nearly $1 trillion daily.

Walsh had previously worked at Burroughs Corp. from 1962 to 1969, then served as a management consultant at Booz, Allen & Hamilton, Inc. He was also assistant vice president of systems services at the Federal Reserve Bank of New York until 1976, when he became senior vice president of corporate services at Carteret Savings and Loan Association. From 1981 to 1983, Walsh was senior vice president/executive officer of the Data Services Division at Connecticut National Bank.

Walsh resided in Pleasantville, N.Y. He is survived by his wife, Irene, and two sons.

COMMENTARY

Les Gilliam

Developing an information security policy

Your company, like so many others, may be dependent on electronically stored and transmitted information. If so, the growth in the use of telecommunications networks, electronic data interchange, personal computers, off-premises terminals and dial-up access has caused the protection of corporate information to become a high-priority issue.

Many senior managers are concerned about the risk of loss or diversion of vital data as well as the possibility of a damaging or embarrassing incident occurring.

To address these potential risks, many corporations are developing an information security policy to assure senior management that line managers and employees are taking all reasonable steps to protect the corporation's information assets.

An information security policy should state that all information resources are corporate assets and that they should have appropriate security protection, as would any other corporate asset. These information resources include hardware, software, data, images, text, graphics, networks, voice information and supporting facilities.

Further, the policy should express management's concern over the risk of loss and unauthorized access to corporate computers and electronic information.

The policy should emphasize responsibility and accountability regarding information resources: Every information asset must have an owner; the owners are responsible for providing appropriate security for the assets under their jurisdiction and are accountable to management for the use and protection of those assets.

The policy should also make the point that protection must be appropriate for the value of the asset at risk.

The information security policy should cover all aspects of protection, such as physical security, disaster recovery, password management, backup and restore, applications design and development, program testing, controls, documentation, copyright and patent protection, copyright compliance, telecommunications security, dial-up restrictions and security administration.

In addition, the policy should address local-area networks, facsimile machines, answering machines, radios and mobile and cellular phones.

The policy should be organized in a logical fashion, grouping general standards together with specific areas following. For example, the policy will likely begin with an introduction or a letter from senior management explaining the current business risks that warrant the development of the information security policy and the expectations for compliance with the policy. It should state that the auditing department will report known violations.

Next, the section on general standards that are relevant to all types of computing will be presented. Included in this section should be topics such as physical security, disaster recovery, asset ownership, password management and security administration.

The sections that follow should cover the various types of computing resources in the company, such as mainframes, departmental computers, PCs, process control and telecommunications.

The policy should also address other relevant issues, such as nonemployee personnel and the responsibilities of the policy committee. A glossary may also be desirable.

Developing a corporate information security policy can usually start with the appointment of an information security policy committee. It is important for the committee to represent both information systems and users.

The team can begin by writing the project objectives, developing work plans and making assignments. It is helpful for team members to research similar policies of other companies and to conduct interviews within the company to establish requirements and parameters for the policy and to develop the master outline.

Next, the team will write drafts of the various sections of the policy, review and revise the drafts and distribute to key individuals for editing.

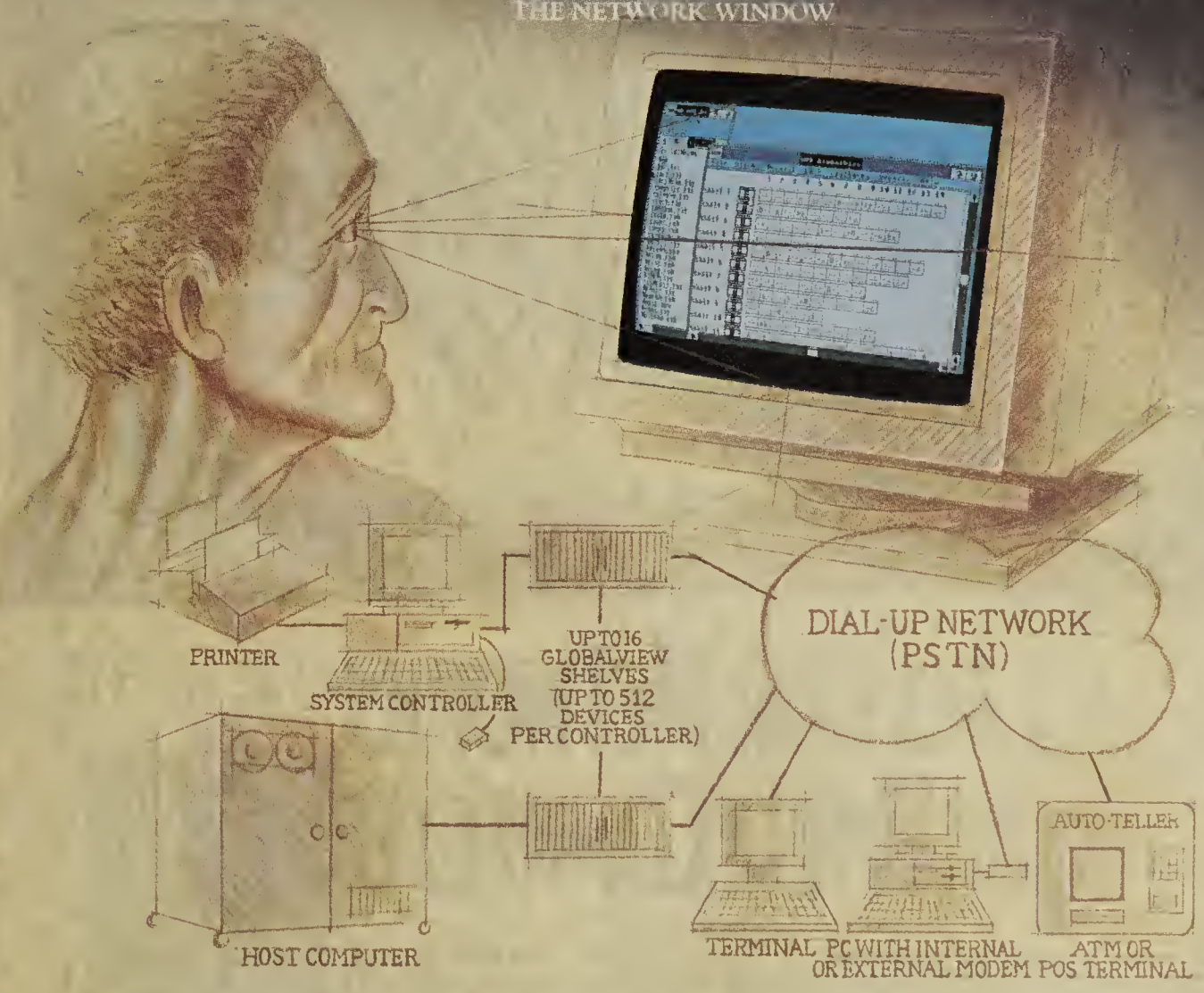
The final draft can then be sent to senior management for review and approval, after which the policy can be published.

Thereafter, the auditing department will look for compliance in the normal course of auditing the various departments and will report to management.

The policy committee should meet periodically to discuss issues relating to the policy, circulate revised versions of the policy as appropriate and keep senior management informed of the status of and compliance with the policy.

Gilliam is president of Gilliam Associates, a computer management consulting firm in Ponca City, Okla.

GlobalView™
THE NETWORK WINDOW



A Classical Approach to Control Of Contemporary Dial-up Networks

The advantages of powerful, sophisticated network control systems, while available to managers of large leased-line networks, have been denied to dial-up network users. GlobalView ends that disparity.

Now you can monitor, configure and control as many as 512 local datacomm devices and any number of remote devices from a single location. You may control network security parameters, trace problems to individual devices and oversee resource allocation. Real-time and historical reports are available via color monitor, with hard copy generated for later analysis.

GlobalView is comprised of Microsoft® Windows-based software, an evolving variety of modems and other datacomm devices and a compact (7"×19") equipment rack for use with your 80286-based PC controller.

GlobalView is the classical solution to contemporary network management problems. For specifications, pricing and applications assistance, contact UDS, 5000 Bradford Drive, Huntsville, AL 35805-1993. Telephone 205/430-8000; FAX 205/430-8926.

UDS
MOTOROLA

Created by Dayner/Hall, Inc., Winter Park, Florida

BOOK REVIEW

A hopeful look at The Big Picture — and how IS fits into it

G-FORCES
By Frank Feather
William Morrow and Co., $22.95

Information systems professionals are often advised to stretch beyond their own technical worlds and "take a broader view." You can't get much broader than *G-Forces.*

The "G" stands for "global" — and that's no overstatement. The author, Canadian futurist Frank Feather, takes readers far beyond the usual IS approach to expanding horizons through "learning the business." In neat, enthusiastic prose, Feather describes 35 major "geostrategic" forces, including information technology, that are reshaping tomorrow's world.

"Great," you're probably thinking. "Another future book telling me that I need to learn Japanese, move to Arizona, get a telecommuting job and begin eating seaweed." But wait, there's something here beyond the usual Pollyanna vision of techno-uptopian bliss.

What makes Feather different — and relevant for IS readers — is his ability to credibly tie technology into a wider, longer view of world development.

Feather sees computers, telecommunications and other modern inventions not as devices that sprang from nowhere and took on a life of their own but as catalysts and evolutionary stages on the way to a new 21st century leisure society based in outer space. It sounds gee-whiz and a bit far out, but Feather makes it all seem plausible.

The so-called G-Forces can be grouped into four categories: social, technological, economic and political. Greatly simplified, the basic idea is that social and human needs spark technological innovations. These, in turn, are harnessed to restructure and modernize the planet, with an eye toward producing worldwide wealth for all. Finally, this new economic order produces political and governmental reform.

The common agent of change and wealth creation, according to Feather, is information.

While few IS professionals may feel like they are creating a new world order in their everyday work, Feather says that, bit by bit, they are doing precisely that. He concludes that technology will be instrumental in ushering in the "Fifth Wave" leisure and tourism economy by 2020. He is particularly hopeful about supercomputers, Next, Inc. workstations and Integrated Services Digital Network and predicts that Japan will be *the* superpower of the information age for the next 30 years.

An appealing aspect of *G-Forces* is a belief that the future doesn't just happen, it is made. The book builds on the ideas of futurists Buckminister Fuller, Alvin Toffler, Marshall McLuhan and Jonathan Schell and suggests that gloom and doom scenarios are not inevitable. "By 2050," Feather boldy asserts, "we can reinvent the world."

Some readers might tire of Feather's mighty and unflagging optimism. But in the gray, post-Reagan 1990s, a little *realistic* positive thinking might not be all that bad, and *G-Forces* manages to get away with it most of the time.

Not that it matters· the author, a self-described "pragmatic business man" — seems almost unconcerned about his ideas being seen as practical — or even feasible. He is content, Feather writes, "to disturb . . . to change some minds . . . to reject doomsday attitudes."

Feather brings impressive credentials to the task. A 22-year veteran of world banking, the English-born author has advised the International Monetary Fund, the World Bank and the United Nations. Since 1981, he has been president of a Toronto firm that consults on a wide range of topics — including global economics, technology transfer and strategic planning. *G-Forces* is his first book.

For IS professionals, *G-Forces* can help lend perspective and meaning to an increasingly complex and abstract technological working world. It does so by shattering the deep-seated — and often unconscious — belief of many in IS that technology exists for and unto itself.

As recent business history has shown, technology exerts a profound influence on the company that deploys it. It follows, Feather argues convincingly, that this effect will also be felt by the whole human race magnified a billionfold.

At 438 pages, *G-Forces* is hefty but modular. It's packed with charts, diagrams and lists. It also features an extensive bibliography.

If you feel that your work life is buried in Cobol debugging or downsizing planning, and you want some perspective, *G-Forces* offers an interesting version of The Big Picture. If you love drowning in your daily minutiae, that's all the more reason to read it.

JOSEPH MAGLITTA

Maglitta is a *Computerworld* senior editor, In Depth/Integration strategies.

ALL OUR NETWORKS ARE WELL CONNECTED.

Choosing the best computers for your company is one thing. Making them work together can be a whole different animal.

Fortunately, the network experts at Data Preference have experience with all different breeds of computers and the training needed to get your whole office pulling together.

That's because Data Preference offers everything you need to assemble a network. From PCs to peripherals to minicomputers to workstations to network software. Products that answer to such famous names as Apple, AT&T, DEC, IBM, Novell, 3Com, and too many more to mention here.

And we offer a fetching range of services to keep your network healthy and well-groomed. Including installation, on-site maintenance, and a toll-free diagnostics hot-line. As well as a full range of finance programs, whether you want to rent, lease or buy.

So, when it comes to keeping your computers well connected, there's only one name worth calling. Data Preference, the network experts. Why not take a walk to the phone and call us now?

DATA Preference
Incorporated
Formerly Leasametric Data Communications, Inc.

Northwest 800.343.7368, 415.574.5797 • Southwest 800.638.7854, 818.708.2669 • Central 800.323.4823, 708.595.2700 • Northeast 800.241.5841 • Southeast 800.241.5841, 404.925.7980 • London 011.44.923.897000. Copyright © 1990 Data Preference Incorporated.

Explore The Wide Open Spaces Of Progress For Yourself.

☐ I'm interested in taking the PROGRESS Test Drive. Please contact me.
☐ I'm evaluating 4GL/RDBMSs now. Please send the demonstration video and contact me.
☐ I'm interested in finding out more about PROGRESS. Send me an information packet which includes a free copy of the Datapro report.

Ask for the PROGRESS Test Drive, a full function evaluation copy of the PROGRESS 4GL/RDBMS including a working PROGRESS application.

1. My hardware system: _____

2. Kind of applications I develop: _____

3. I plan to buy a 4GL/RDBMS in:
☐ 3 months ☐ 6 months ☐ 12 months

Attach your business card here or fill in below.

Mr./Ms. _____

Title _____

Company _____

Dept./Mail Stop _____

Street _____

City _____ State _____ ZIP _____

Phone ( ) _____

For *FASTEST* response call Inside Sales toll-free today.

800 FAST 4GL (800 275-4595)

Outside U.S.: 617 275-4500. Fax 617 275-4595.

This order subject to acceptance by Progress Software Corporation.

CW11/T

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 6 BEDFORD, MA

POSTAGE WILL BE PAID BY ADDRESSEE

PROGRESS SOFTWARE CORPORATION
5 OAK PARK
BEDFORD MA 01730-9960

Welcome To The Wide Open Spaces Of Progress.

Welcome to a 4GL/RDBMS world that lets you decide how to build and run an unlimited range of applications without the usual limits. Without the usual constraints.

Take a seat and let us explain.

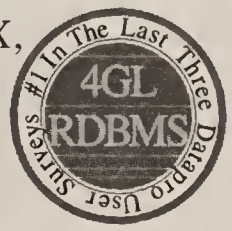
To begin with, the PROGRESS 4GL lets you build with incredible efficiency while giving you the control of a full-structured programming language.

When the name of the game is development speed, you've got it. When the name of the game is control, you've got it. When the project calls for both, you've got both.

And just to make sure you like the view, you've also got a menu-driven application builder, ANSI-standard SQL and 3GL access if you want it. You've got a true distributed RDBMS with client/server architecture and two-phase commit. You've got multi-threaded, scalable performance on large multi-processor systems.

But stay seated, there's more.

PROGRESS ties together data across different operating systems, networks and databases. It lets you port applications without modification across UNIX, VAX/VMS, OS/2, DOS (even 640k PCs) and CTOS/BTOS with AS/400 coming soon. PROGRESS applications run unchanged over distributed networks using TCP/IP, DECnet, NetBIOS and SPX/IPX. They even update Oracle, Rdb, RMS and PROGRESS databases simultaneously.



What it all adds up to is 40,000 installations in 30 countries covering every conceivable application. Plus the #1 rating for efficiency, reliability, and overall user satisfaction in Datapro's last three surveys.

So find a phone and call **800 FAST 4GL** to find out about the PROGRESS Test Drive and the full Datapro report on PROGRESS.

Once you step into our world, you'll never want to leave.

Progress Software Corporation
5 Oak Park, Bedford, MA 01730
Telephone 617 275-4500
Fax 617 275-4595

PROGRESS is a registered trademark of Progress Software Corporation.

Datapro, UNIX, VAX/VMS, OS/2, DOS, CTOS/BTOS, AS/400, TCP/IP, DECnet, NetBIOS, SPX/IPX, Oracle, Rdb, and RMS are registered trademarks of their respective manufacturers.

PROGRESS®

The Usual Limits Don't Apply.™

CW11/A

Open systems

CONTINUED FROM PAGE 77

David Carlson, senior vice president of corporate IS at K Mart Corp. in Troy, Mich., has not found vendor support to be quite so hostile, but neither have open systems vendors been entirely helpful. He says he has used the freedom of vendor choice to coax more help out of them.

"If it's proprietary, the vendor might pinpoint the problem, but resolution doesn't get done any faster because they think they won't get kicked out," he says. Managers must often pinpoint the areas in which vendors will help, while developing in-house expertise in areas where they will not help. Carlson says that he uses a third-party maintenance organization for hardware. For the operating system, he either gets the vendor to fix any problems or switches vendors — exemplifying the leverage that customers can have in the open systems world.

Carlson says K Mart switched from IBM's AIX to The Santa Cruz Operation's version of Unix because of support issues.

"But if it's the application, that's our own doing," he adds. "We have to take the responsibility for fixing it."

Most managers agree that software is the most aggravating and costly aspect of vendor independence. Before migrating to a new release, "you have to go back to your package suppliers and make sure the packages and the development tools will run on the new operating system," McDowell says.

Peter Yates

K Mart's Carlson *uses 'freedom of choice' for leverage*

Jeff O'Neil, director of advanced systems at Arco Research and Technical Services in Plano, Texas, says that developing software in-house for the new Unix environment is getting better, but it's still "nasty." He is looking into better graphical user interfaces to protect his developers from the vagaries of the various versions of Unix. "It will get better as we raise the abstract from Motif and Open Look to object-oriented programming," O'Neil notes.

While portable software should be cheaper than proprietary, it usually is not, McDowell adds. He says there are layers of software that are necessary to buy with open systems, such as an interpreter between the databases of Sybase, Inc. and Oracle Systems Corp., even though they are both Unix-based.

"Say you have two databases you want to run on a machine. I have to spend an incredible amount of money on an interpreter to make them work together," O'Neil says. "On the positive side, though, the scalability is great."

While managers involved with open systems agree they have to trade in more responsibility for the advantageous economies of open systems, they said that in general, it is worth it.

> MOST MANAGERS agree that software is the most aggravating and costly aspect of vendor independence.

"You have to do a lot of training, and it's a big up-front cost," says Roger Cooper, deputy administrator for management at the Farmers Home Administration. But, he says, once the training is done, staff will have transferable skills, and "you'll make your money back in a year or two."

Money is indeed the reward for indulging in open systems. Carlson estimates that, since 1985, his company has saved more than $100 million over proprietary-based systems.

"By putting hardware out to bid, there's an implied threat that we'd switch hardware vendors," he says. "We use that leverage. We buy in large lots, and the pricing is extraordinary." The last bid Carlson put out was for 1,000 workstations.

"You have more control," Cooper agrees. "You can really ratchet on the vendors. But there are no free lunches. It takes up-front time."

It is the early adopters of open systems who are facing the management issues head-on.

Open systems vendors "will not advise you in a way that you will go buy other vendor's products," Ticoll says. "The leading-edge users are fighting the battle for the rest of us."

"...A HUGE APPLICATION, AND THE 3090 NEVER FLINCHED."

A USER'S CHALLENGE:

A leading bottled consumer goods producer brought up a mainframe application to gain competitive advantage in its fight for retail shelf space. Within months, it proved so valuable that it grew from five to 15 gigabytes. By the time the company installed an IBM System/3090 Model 200E with 64 megabytes of main storage to manage the application (and run the company's routine IS applications), it was already short of central storage capacity. Rather than slowing down expansion of the strategic job, the company bought Cambex STOR/9000 central storage for a fast low-cost productivity solution. The IS director made the Cambex decision quickly: he had used Cambex memory for years in an earlier IBM mainframe, and knew the Cambex price-performance-reliability solution was a good one. Ask your Cambex representative for more information on this fine user.

CAMBEX TO THE RESCUE.

Cambex builds IBM System/3090 central and expanded memory — *and now 3990 cache* — storage devices that give MIS executives the ability to add mainframe functionality faster. The Cambex solutions are the only ones that assure 100 per cent compatibility with IBM's own storage cards. That means a fast install, fast diagnostics and superior reliability at minimal risk. In the past two years, 3090 users have installed more than 30 billion bytes of STOR/9000 storage (*and over a billion bytes of our new STOR/3993 cache memory in the past 60 days!*). Make your 3090s do more for less. Call Cambex now.

Cambex Corporation
360 Second Avenue
Waltham, MA 02154
617-890-6000

Cambex

Announcing the end of the phone bill.

Introd

The AT&T Intelli

It tells you more about your

AT&T Billing Information Manager. The intelligent way to bring order to your billing.

Give your business the benefit of the Intelligent Phone Bill from AT&T Billing Information Manager. Here are just a few examples of what it can do for you.

❑ Executive Summary:

You can learn a lot from your phone bill when AT&T Executive Summary Reports break out your billing. This can help you pinpoint busy days. Identify unusually long or short calls. As well as discover patterns and trends hidden in your call traffic. And the best thing is that all this information is standard with your monthly bill on most of our services.

❑ Detail Manager:

Maybe you need a more detailed report. With AT&T Detail Manager, you can get a customized billing report any way you want it. Zip code, area code, frequency of usage, length of call, city, state, even cost category. You name it, we do it. Once your billing is in order, information becomes clearer and you can better manage your business.

❑ Execu-bill:

Organize your billing by calling card. With AT&T Execu-bill reports, we can break out your calling card usage by location, region or department. In fact, these reports can be designed to match

© 1990 AT&T

ucing
gent Phone Bill.
usiness than what you owe.

your corporate structure. So you can control calling card use, identify high cost centers and track expenses more easily.

❑ Call Manager:

AT&T Call Manager can organize your billing with the push of a button. Just enter a code and the call is automatically sorted as you dial. It makes life easier for anyone who has to assign costs to clients and projects, account for business and personal calls or keep track of departmental expenses.

❑ Summary Billing:

Now when it comes to billing, we can break it out and send it out in a way that matches your company's structure. With AT&T Summary Billing, we can provide service information to your branch offices and send the bill to your main office. Or we can do just the opposite. You decide who gets what information, and in the end, the bill is easier to pay.

So whether you need a lot of detail or just a little, we have an option that's just right for you. The AT&T Intelligent Phone Bill. It'll be the one bill you'll find a pleasure to read.

AT&T Billing Information Manager. Another AT&T advantage.

For more information, contact your AT&T Account Executive or call 1 800 247-1212, Ext. 142.

AT&T
The right choice.

CALENDAR

Four user case studies will highlight "The Downsizing Conference: Moving from Mainframes to PCs," a Digital Consulting conference to be held in San Francisco on Jan. 21-22.

Managers from Chevron Canada, United Parcel Service and Rogers Group will present their experiences in moving applications to smaller platforms. More general and technical issues will be covered by consultants, including Richard Finkelstein, Jeffrey Tash and Larry DeBoever.

For more information, contact Digital Consulting, Andover, Mass. (508) 470-3880.

DEC. 9 - 15

Networking with Macintash. Orlando, Fla., Dec. 9-12 — Contact: Pam Schur, MACIS, Chicago, Ill. (312) 644-6610.

Bring Technology to Market. Palo Alto, Calif., Dec. 10 — Contact: Jeanette LeVert, Regis McKenna, Palo Alto, Calif. (714) 850-4420.

Virtual Reality: Theary, Practice and Pramise. San Francisco, Dec. 10-11 — Contact: Kim Devan, Westport, Conn. (203) 226-6967.

Fed Unix '90. Washington, D.C., Dec. 10-11 — Contact: Fed Unix '90, Bethesda, Md. (301) 229-1062.

Global Netwarking Conference. New York, Dec. 10-11 — Contact: Telecommunications Report, Conference Dept., Washington, D.C. (202) 347-2970.

CMG '90 International Conference. Orlando, Fla., Dec. 10-14 — Contact: General Chairman, CMG '90, CMG Headquarters, Chicago, Ill. (312) 938-1228.

Comfarum. Orlando, Fla., Dec. 10-14 — Contact: Comforum, Chicago, Ill. (312) 938-3500.

Annual Flat Infarmatian Displays Canference and Exhibitian. Santa Clara, Calif., Dec. 11-12 — Contact: Murray Disman, Information Associates, Menlo Park, Calif. (415) 322-0247.

Dexpa West '90. Las Vegas, Dec. 11-13 — Contact: Dexpo Registrar, Boston, Mass. (617) 730-5708.

Database Warld Conference & Expasitian. Boston, Dec. 11-13 — Contact: Digital Consulting, Andover, Mass. (508) 470-0526.

JAN. 6 - 12

Internatianal Security Canference and Expasitian West '91. Anaheim, Calif., Jan. 9-11 — Contact: Cahners Exposition Group, Des Plaines, Ill. (708) 299-9311.

Mathematica Canference. San Francisco, Jan. 12-15 — Contact: Maury Kendall, Wolfram Research, Champaign, Ill. (217) 398-0700.

JAN. 13 - 19

Pacific Telecammunicatians Canference: Accessing the Glabal Network. Honolulu, Jan. 13-16 — Contact: PTC, Honolulu, Hawaii (808) 941-3789.

Natianal Retail Federatian Retail Industry Canventian and Expasitian. New York, Jan. 13-16 — Contact: NRF Convention Registrar, New York, N.Y. (212) 563-5113.

Technical Canference an the X Windaw System. Boston, Jan. 14-16 — Contact: MIT Laboratory for Computer Science, Cambridge, Mass. (617) 253-8861.

Telecam Skills Workshops. Waikiki, Hawaii, Jan. 17-18 — Contact: Pacific Telecommunications Council, Honolulu, Hawaii (808) 941-3789.

NOMDA East Regional Canventian. Orlando, Fla., Jan. 17-19 — Contact: Katy Dunn, NOMDA, Kansas City, Mo. (816) 941-3100.

JAN. 20 - 26

Data Visions '91. San Francisco, Jan. 20-23 — Contact: Earle Speranza, Wordtech Systems, Orinda, Calif. (415) 254-0900.

Unix Technical Canference. Dallas, Jan 21-25 — Contact: Usenix Conference Office, El Toro, Calif. (714) 588-8649.

Infatext '91. Las Vegas, Jan. 22-23 — Contact: Bob Dale, Infotext Publishing, Capistrano Beach, Calif. (714) 493-2434.

Uniforum 1991. Dallas, Jan. 22-24 — Contact: Bob Linke, PEMCO, Des Plaines, Ill. (708) 299-3131

JAN. 27 - FEB. 2

Communication Netwarks '91 Canference and Expasitian. Washington, D.C., Jan. 28-31 — Contact: Michael Sullivan, World Expo Corp., Framingham, Mass. (508) 820-8268.

Netwark Computing Farum and Expasitian. Washington, D.C., Jan. 29-31 — Contact: Christine Krajewski, World Expo Corp., Framingham, Mass. (508) 820-8126.

FEB. 3 - 9

Macapp Canference. Phoenix, Feb. 4-8 — Contact: Macapp Developers Association, Everett, Wash. (206) 252-6946.

Macintosh/N.Y. '91. New York, Feb. 5-7 — Contact: Peter Kimpton, Exposition Management, Waltham, Mass. (617) 290-0412.

Flarida Educatianal Technalagy Conference. Tampa, Fla., Feb. 5-8 — Contact: Barbara Ann Cox, Office of Educational Technology, Tallahassee, Fla. (904) 488-0980.

NOMDA West Reglanal Canventian. San Diego, Feb. 7-9 — Contact: Katy Dunn, NOMDA, Kansas City, Mo. (816) 941-3100.

FEB. 10 - 16

Video Expa. San Francisco, Feb. 11-15 — Contact: Debbie Rotolo, Knowledge Industry Publications, White Plains, N.Y. (914) 328-9157.

Managing Infarmatian Technalagy when the Going Gets Tough. London, Feb. 12 — Contact: Suzy Mayhew, London, England 071 236 4080.

FEB. 17 - 23

Narthwest Camputer Show. Minneapolis, Feb. 19-20 — Contact: Judy Koch, Plymouth, Minn. (612) 420-5376.

Looks like your data backup system is down for about a week.

Who backs up the person who's responsible for backups? If somebody at one of your remote sites is sick or on vacation, is critical data protected?

Or does it just lie there, exposed?

Network Systems' Central Archiving package puts the job of safeguarding data where it belongs: at your main data center. With Central Archiving, your mainframe system (IBM, for example) automatically backs up data from remote minis (like a VAX) and networked PCs anytime you want.

Plenty of companies have gotten burned because they couldn't recover lost data, even from simple disasters like a disk crash.

Make sure your operations don't get beached. Call 1-800-338-0122.

Network Systems®

© 1990 Network Systems Corporation

BOTTOM LINE COMPUTING:

The Challenge for the '90s

"After spending millions of dollars on computing, corporations now must find ways to make their investments pay off. Downsizing corporate systems, client/server computing and outsourcing have emerged as the key issues companies must face to thrive in the '90s."

Richard A. Shaffer
Editor and Publisher of *Computer Letter*

A SPECIAL ADVERTISING SECTION SPONSORED BY BUSINESSLAND, INC.

"Downsizing" Corporate Applications

The concept of "downsizing" has attracted much attention from the IS community recently and has generated even more controversy. At one extreme, there are those who argue that we will be able to "throw away the old dinosaur" as soon as we port the application down to the PC. At the other extreme, there are those who argue that the PC will only add "cosmetic" value to the corporate data processing function. The truth is obviously somewhere in the middle. Systems of all sizes will have full citizenship in the distributed enterprise environment—and "downsizing," as a type of distributed processing, can be used to "distribute the workload" throughout the environment.

This downsizing, or rearchitecting selected corporate computing jobs to run on distributed systems, is an exciting new option for MIS—a result of continuing improvements in computer systems technology. Distributed networks involving powerful servers and intelligent workstations are now helping mainframes cope with the growing information requirements of the '90s. Downsizing can offer the savvy MIS manager some new options:

- in managing systems, support and maintenance costs;
- in applications development;
- in managing technology turnover; and
- in optimizing data access throughout the organization.

Just as the IS executive "managed the business" in the past by leveraging all available technology and systems resources, so too will they be applying this expertise to these new tools in their portfolio of technology options.

Many of the nation's largest PC users have already moved some of their mission-critical applications from minicomputers or mainframes to distributed servers on PC LANs. But while the lure of less expensive hardware is strong, downsizing is not a simple or risk-free venture—it requires careful planning.

Companies wanting to distribute their applications must consider the new demands that this will place on their existing host mainframes or minicomputers. Large system manufacturers such as IBM are preparing for the change.

"We're working aggressively to address customer requirements for total integration of the enterprise-wide network," says Ellen Hancock, vice president and general manager of IBM's Communication Systems business organization. "We see large host computers acting as high performance servers for multivendor networks." To facilitate this new role, IBM and other companies are developing sophisticated connectivity and network management capabilities that allow access to and management of such multivendor networks—including wide area networks that link remote sites—providing users anywhere in the world with access to the data and resources needed to do their jobs.

Expanding functionality of large host computers to have them act as file servers lets MIS leverage large existing bases of applications and services. In most cases, this could lead to greater efficiencies for in-house programming and support used to maintain the corporate computing environment. "The users' overriding need is for systems capabilities that enable them to respond quickly and cost-effectively to the constantly changing business environment," says Charles E. Exley, CEO and chairman of NCR Corporation. "The microprocessor-based architectures and industry-standard operating systems support this need by providing access to thousands of packaged applications and a universe of consulting and support services."

Effectively implementing distributed systems may require expertise your company might lack, however. For use in a distributed environment, host computer applications would have to be modified and companies would have to develop effective means of managing data resources across distributed networks. In many cases, firms form close partnerships with outside service providers with specific expertise in downsizing. Standardized entities, such as database engines based on Structured Query Language (SQL), can ease the transition by allowing companies to maintain a smooth information flow throughout the corporation while allowing hardware diversity.

In those situations where downsizing is appropriate, the option of distributing the application load among the various computing devices in the enterprise network can prove to be another effective tool in managing your information technology investment toward achieving your business goals.

"Downsizing" at Pillsbury

At Pillsbury Brands, a part of the Food Sector of Grand Metropolitan PLC, downsizing led to new applications, lower costs and better management control.

The decision to downsize was made after an analysis of Pillsbury's aging mainframe system revealed a critical need for better communication between the company's Minneapolis headquarters, plant sites and sales offices.

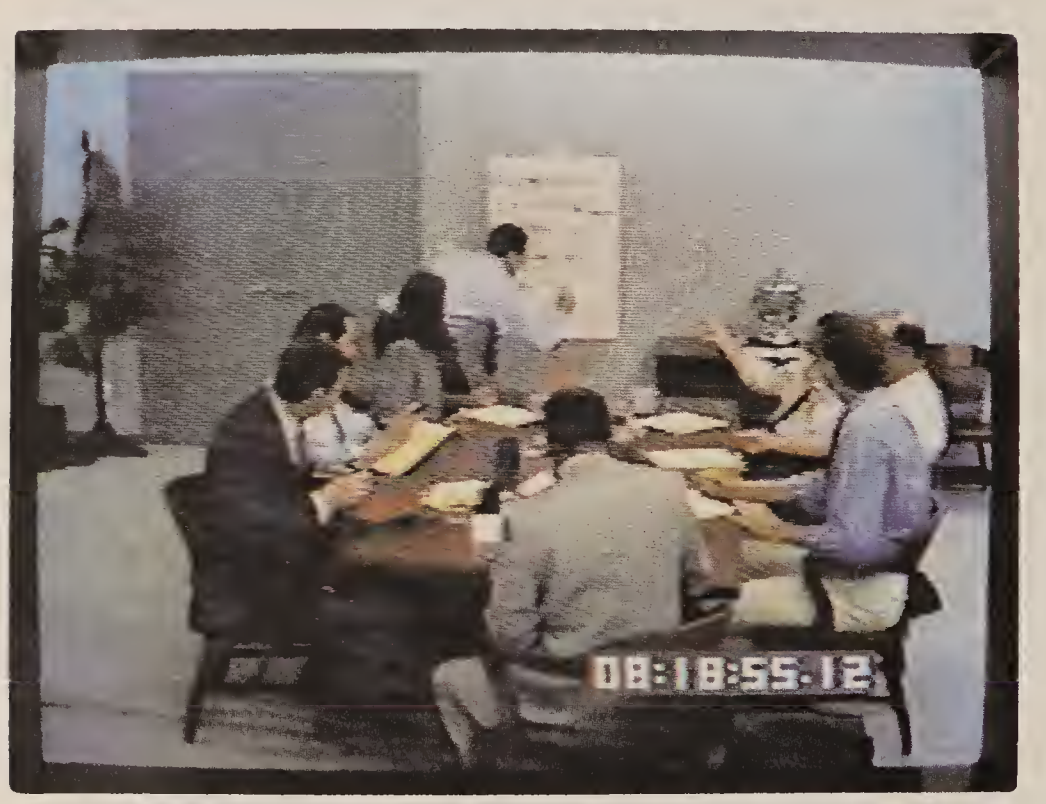
"Companies of every size are constantly looking at ways to cut costs while improving information management systems," says Irene Stecher, MIS manager at Pillsbury Brands. "Large organizations are now planning microcomputer-based, enterprise-wide network solutions to improve their competitiveness in the '90s. We decided that was the right way to go."

Downsizing to PC LANs allowed Pillsbury to distribute processing power where it was needed, and to implement a company-wide electronic mail network. PC LAN servers handle critical database applications at headquarters and plant sites, while users at individual PCs in Pillsbury sales offices can enter orders directly via modem.

By downsizing to more cost-effective, accessible LAN servers, Pillsbury streamlined its information flow while improving network manageability. PC LAN servers now running common operating systems and applications throughout the organization make the system easier to support and manage than ever before.

"My ultimate PC system? Well, for starters, it's got to be compatible with everything I've got already... so you can take a floppy from an old PC, pop it into a new one, and it will work."

"Networking PCs is a major pain. I'd like to see PCs designed to do networking without lots of configuration work... and still connect with all the networks I've already installed."



"We've got plenty of data... the challenge is to put it in the hands of decision makers in a form they can use. The perfect PC would be an ideal client to all my information systems."

"Every time I turn around, vendors change the operating system or interface. I want to be able to drop the hottest new box on my executives' desks and know their software will run."

Hidden camera reveals the se

Not long ago, we invited hundreds of IS managers to talk about their wildest desires in a personal computer system.

They talked. We listened. We videotaped. And when we got those tapes back to Silicon Valley, popped them in the VCR and started watching, it confirmed what we knew all along.

They wanted a personal computer system that was compatible enough with their existing PCs to trade files on floppy disks. Like Macintosh.®

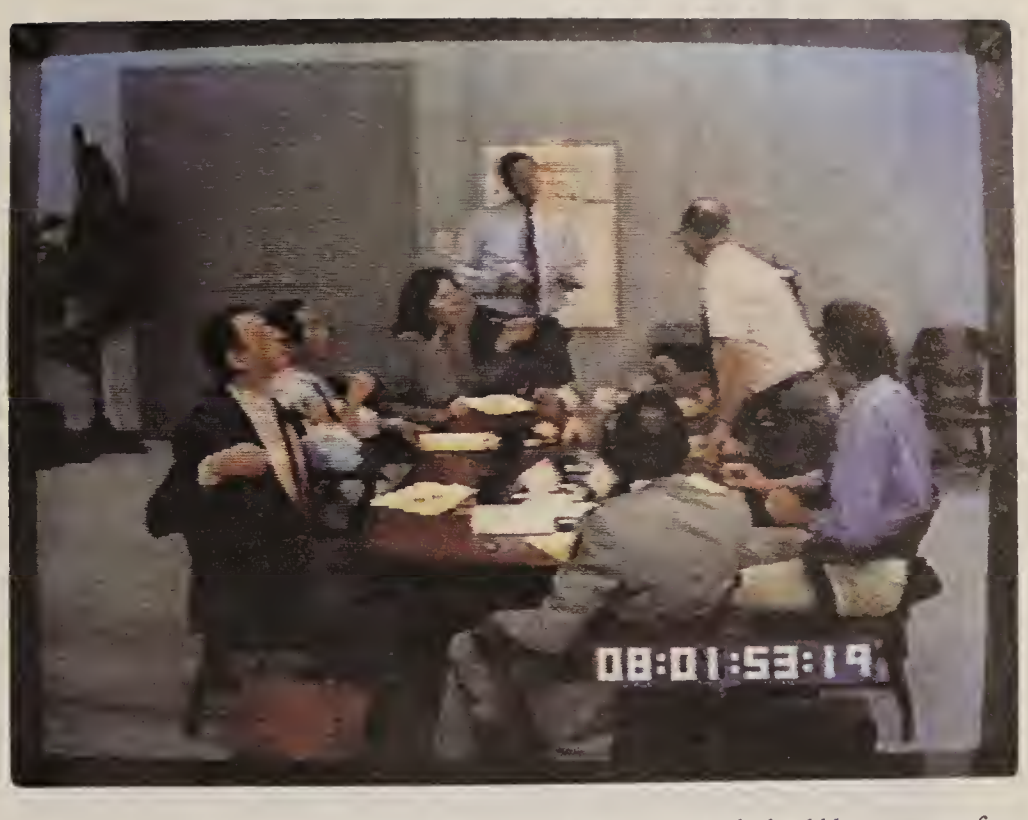
They wanted a system with the power and flexibility to run thousands of business programs and almost any kind of operating system: MS-DOS, Macintosh and UNIX.® Like Macintosh.

They wanted a graphical user interface with no compromise in performance. Like Macintosh.

And they wanted all their software to have a single way of working, so training and support costs could be dramatically lower. Like Macintosh.

© 1990 Apple Computer Inc. Apple, the Apple logo and Macintosh are registered trademarks, and "The power to be your best" is a trademark of Apple Computer Inc. UNIX is a registered trademark of AT&T Corporation. MS-DOS is a registered trademark of Microsoft Corp. The above quotes are representative samples of what IS managers have told us.

"A graphical interface is clearly important… users love 'em. But the architecture has to be designed to handle it or the performance compromise is unacceptable."



"I'd like to see more discipline from software developers. Commands should be consistent for every application… it would eliminate the cost of constantly retraining."

"My company's needs go way beyond off-the-shelf software. I need serious development tools my existing programming staff can use to develop custom apps quickly and easily."

"Macintosh? No kidding?"

cret desire of 200 IS managers.

They wanted a system with sophisticated networking capabilities built in, that could let users access almost any host or file server via any kind of network. Like Macintosh.

They wanted all these things in a wide range of personal computers. That would all work the same way and run the same software. Like Macintosh.

And they wanted powerful development tools that would let their existing programming staff build applications quickly and easily. Like Macintosh.

In short, they wanted everything that Macintosh offers. But they just didn't realize they could have it today.

For all the details, see an authorized Apple reseller today.

Now that we know all of your secrets, it's time you found out about all of ours.

The power to be your best.™

Client/Server Computing

In the rush toward personal computer productivity during the 1980s, many companies leapt from the proven security of centralized time-sharing systems to the relative chaos of early PC networks. In this explosive environment, technologies and standards evolved quickly. Unfortunately, this runaway evolution of diverse computers on divergent LANs created a technological Tower of Babel. Within its walls, corporate data stored on one computer could not easily be accessed by or managed from another. Client/server computing bridges these differences, providing corporate-wide data access and control. In this new environment, data may be stored on different servers from different manufacturers. These servers run the gamut from mainframes to microprocessor-based LAN servers. Now, the entire corporate computing plant becomes a data service network allowing individual users—also known as "clients"—access to the data they need. And because of new cross-platform data and network management tools, corporate information managers gain improved control over the system.

Client/server computing makes the departmental server the new point of standardization in the corporate data system. It allows end-users to choose hardware or software that makes them most productive. It gives departments exactly as much computing power as they need in small, cost-effective packages. Collectively, it gives corporations a streamlined system of information management that places data and computing resources where they are needed most.

MIS managers converting to multivendor client/server systems face the challenge of architecture control. In this complex environment where different applications require different hardware solutions, server and network architectures are required to support uniform corporate data standards. In order to succeed at this task, they must allow all data to be exchanged across their networks as smoothly and transparently as possible.

"Moving to a client/server architecture creates the opportunity to significantly improve the corporate information flow," says Michael Spindler, chief operating officer of Apple Computer, Inc. "Along with lower costs and more flexibility, the client/server model creates a peer-to-peer data interchange environment that allows people to work together more productively."

"Today's technology enables us to build network computers that combine the high reliability, data integrity and centralized administration features of mainframes, with the simplicity, flexibility and cost-effectiveness of personal computers," notes Enzo Torresi, president and CEO of NetFRAME Systems Incorporated. "For business-critical applications, a network computer system, or server, makes much more sense than continued investments in minicomputers and mainframes because it's compatible with existing PC standards

and is easier and more efficient to maintain, upgrade and support."

While PC LANs solve many departmental computing needs, selecting their hardware components from the wide variety of available suppliers can be a perplexing problem. With so many applications to accommodate, finding

hardware and software that maximizes local productivity is a true challenge. Fortunately, the client/server computing model allows companies to integrate diverse hardware forms without interrupting the corporate information flow. With the server as the new point of standardization, incompatible hardware can now be integrated through the use of data access standards, like SQL.

"Most companies have a mix of hardware platforms," says Michael Hallman, president of Microsoft Corporation. "Ideally, you want to allow users to work with the desktop system that makes them most productive, while still giving them transparent access to corporate data. Today, there are applications for Windows, MS-DOS, OS/2, Macintosh and other operating systems that all support SQL database access."

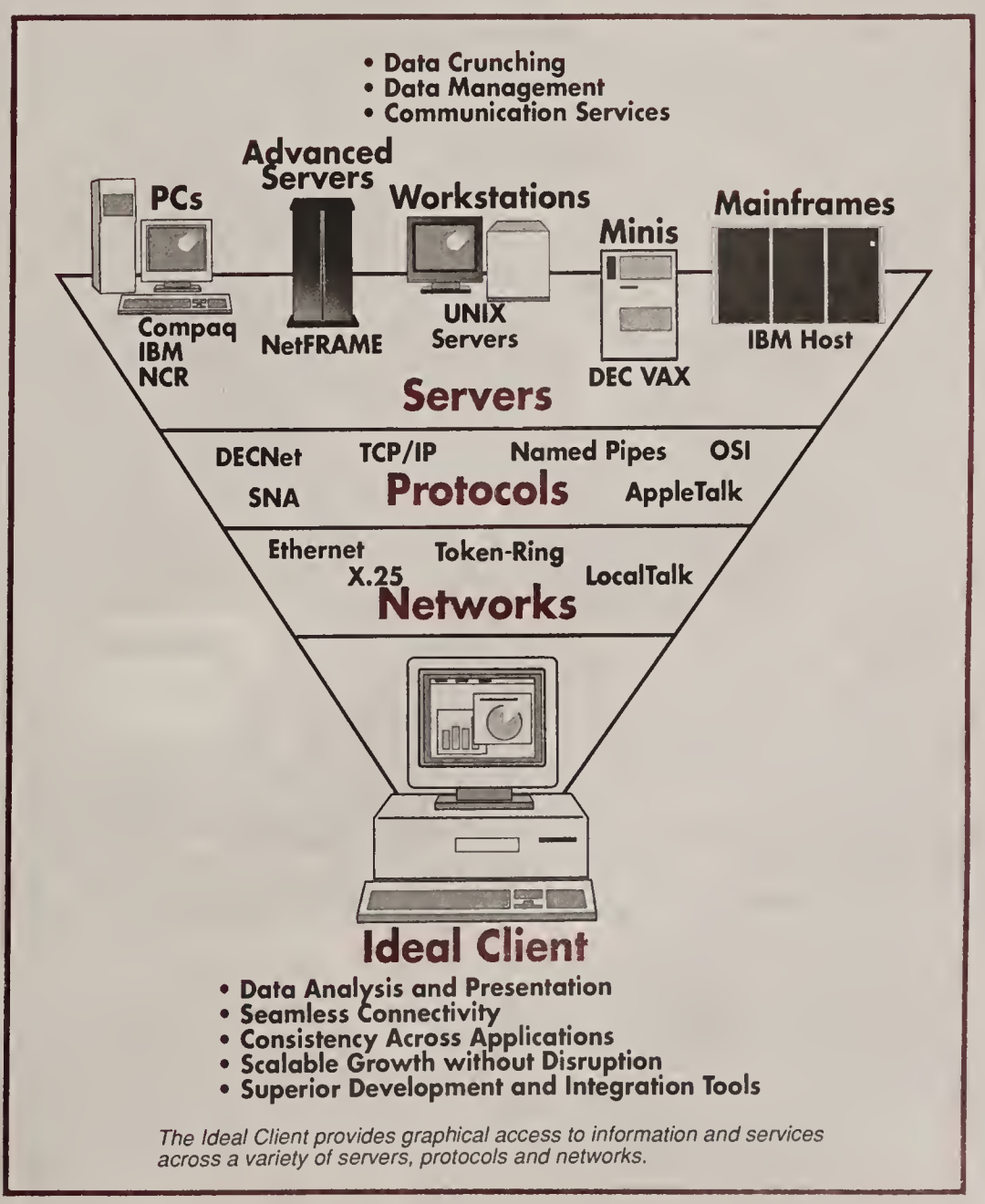
In addition, the client/server model allows companies to maximize previous investments in computer hardware by reconfiguring it for new roles. Mainframe or minicomputer systems that once served as centralized processing centers can be reassigned as high-speed data servers on a client/server network.

In this evolving client/server architecture, the focus moves to using the right tool for the job. Information and services will reside on multivendor platforms—minicomputers, mainframes and workstations—across the network, all acting as servers. The client, the desktop computer, becomes the key point of access to these diverse systems. This places new demands on selecting desktop systems.

"To function as a universal client in a multivendor, client/server environment, the desktop computer must meet four criteria," adds Michael Spindler. "It must offer multivendor connectivity. It should operate consistently across applications, operating systems and network services. It must foster growth without obsolescence of hardware or software, and it must provide a range of applications, as well as powerful development tools."

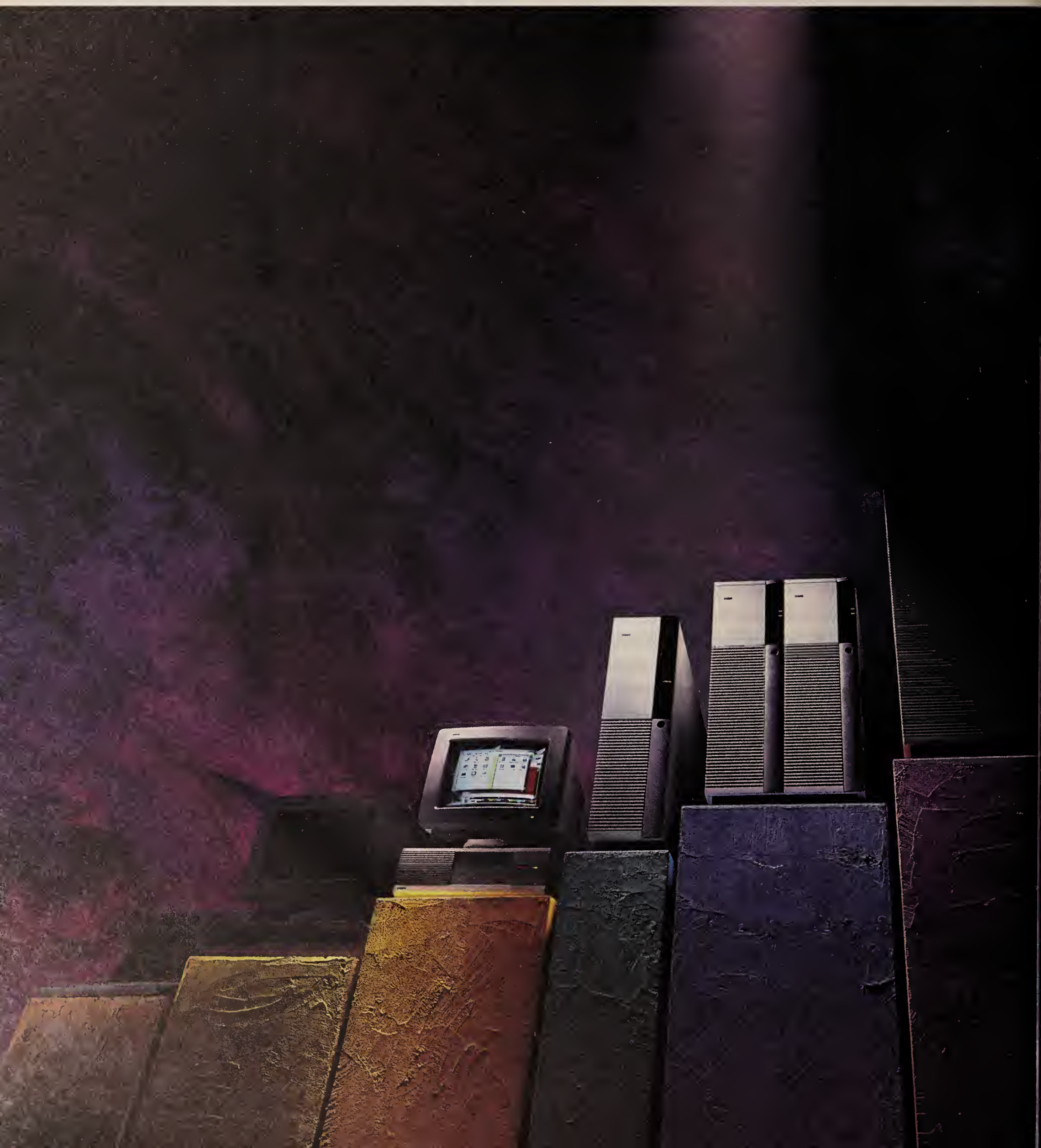
In considering a mix of hardware and software solutions, however, MIS managers must consider the need for comprehensive network management. Client/server computing can make data manageable from anywhere in the corporate network only if the selection of network management tools is made with the same diligence and planning used to select servers and network software.

Properly implemented, the client/server computing model bridges the gap between the centralized formality of mainframes and the flexibility and individual productivity offered by LAN servers. Ultimately, client/server computing is destined to become the dominant corporate computing model.



The Ideal Client provides graphical access to information and services across a variety of servers, protocols and networks.

Introducing The Mo
To Reach New



st Cost-Effective Way Levels Of Power.

The New NCR System 3000 Family Of Scalable Processors.

Microprocessor technology has reduced the cost of processing as much as 100 times compared to conventional computing architectures. In the near future, that cost advantage will grow to more than 300 times.

The NCR System 3000 brings this step-change in technology to a complete family of scalable platforms, running open operating systems like UNIX,® OS/2 and MS-DOS. To give you the widest range of open computing options in the industry.

The NCR 3000 lets you add processing power in cost-effective, incremental steps, rather than large, expensive ones.

From desktops and large servers to future massively parallel models offering more than 100,000 MIPS, our new System 3000 family will provide an unequaled range of performance. So you can add the power you need, when and where you need it.

The NCR System 3000 takes advantage of the Intel® x86 chipset series—the most powerful microprocessors available—to provide you flexibility in design and integration, and an extensive set of existing applications, tools and peripherals. In fact, this system will be among the first to use Intel's new 50MHz i486® microprocessor in a multiprocessing design.

The System 3000 offers total scalability of hardware *and* software, and complete object code compatibility, to give you access to an enormous application software suite. Three levels are now released for sale—offering performance from 7.5 to 320 MIPS. And support for the computing needs of one to hundreds of users.

The System 3000 is designed to connect to your current computing environment. So customers with large investments in proprietary systems can preserve that investment, while moving toward a more flexible, open environment.

For more information on how NCR's System 3000 can help raise your organization to new levels of performance, phone 1-800-CALL-NCR.

NCR

Open, Cooperative Computing.
The Strategy For Managing Change.

NCR is the name and mark of NCR Corporation. Intel and i486 are registered trademarks of Intel Corporation.
UNIX is a registered trademark of AT&T. © 1990 NCR Corporation.

The Outsourcing Issue

These days, trying to manage and support a rapidly diversifying computing environment has become a business in itself. But it is a business your company may not want to be in. Outsourcing—shifting most of the information systems management burden to an outside provider—is increasing as companies seek to cut costs, improve support and remain competitive.

"Corporate computing environments are getting more powerful and complex," says Gary Sorkin, vice president of Corporate Accounts at Businessland. "We feel our customers can be far more competitive by focusing internal resources on strategic or business-specific applications. These add real value, improve performance of support services and decrease associated costs by offloading the delivery of generic or product-specific support services to outside professionals."

Computer support is a burgeoning business. National firms like Businessland offer a wide range of services including systems sourcing (purchasing, order processing, configuration and installation); support services (help lines, LAN/WAN implementation, customized training, product evaluations, on-site maintenance and asset management); and consulting (design and integration, project management, applications design and operational reviews).

Outsourcing can bring a fresh perspective to the overall MIS operation by making people take a business view. "Cost review is just good management practice anyway," says Glenn Miller, director of Business Development at Businessland. "Simply analyzing a potential need for outsourcing can show you how to streamline your services, how to get the most for your money and how to increase competitiveness."

Kodak Opts Out

In July, 1989, Eastman Kodak Company initiated one of the biggest outsourcing agreements to date. The photographic company worked with IBM to establish and manage a corporate data center, and named Businessland as its partner and primary supplier of microcomputer services and systems.

With over 25,000 IBM PC, PS/2, Apple Macintosh and other computers, Kodak's computer staff was struggling to keep up with user needs while staying abreast of the latest technologies. "Kodak is in the imaging products business," says Information Systems Vice President and Director Katherine Hudson. "We are not in the business of supporting computers. We decided that outside vendors could supply systems and support services better and more cost-effectively than we could."

A SPECIAL ADVERTISING SECTION SPONSORED BY BUSINESSLAND, INC.

Don't look now, but there's something moving on your desk.

IBM Personal System/2®s with Micro Channel™ on desks everywhere are starting to exhibit some pretty wild and wonderful tendencies. They're creating incredible on-screen presentations. Interactive tutorials with full-motion video and stereo sound. Graphics, text and animation in harmonious coexistence. What makes it all possible is the multimedia capability of the IBM PS/2® with Micro Channel.

Micro Channel Makes It Look Easy.

The PS/2 itself is designed to put multimedia applications to their best use. Micro Channel has always given the PS/2 extremely fast data rates and better multitasking capabilities. But in multimedia it really gets a chance to shine. The multilane highway design of Micro Channel Architecture is perfect for processing complex multimedia applications. Most conventional PCs just don't have the power or the data paths to do it at all. Plus, Micro Channel in the PS/2 lets you use the new IBM CD-ROM that gives you the storage equivalent of over 400 diskettes on a single CD so you can have access to all kinds of data-intensive material like clip art and digital stereo sound.

Do It All. All At Once.

With a PS/2 with Micro Channel, you can start using some hot products right now. One is IBM's Audio Visual Connection™. It's both a software and a hardware tool that allows your PS/2 to import high-quality audio, dazzling still images, even special effects, as well as text, graphics and other data. Then, you can edit and present it in any combination you like right on your PS/2 screen, share it with a network or project it on a wall. It's impressive, but don't take our word for it—IBM's Audio Visual Connection received *PC Magazine*'s Technical Excellence Award for 1989.

Another exciting multimedia product is the IBM M-Motion Video Adapter/A™. Coupled with the power of Micro Channel, it lets you incorporate full-motion video and high-quality sound from sources like video disks, VCRs and video cameras, digitize them, and display them in an endless array of formats. And for software developers, there are ActionMedia™ cards, which use the latest DVI™ Technology, allowing full-motion video and analog sound to be compressed, digitized, stored on a hard or optical disk and played back in real time.

You've Already Got The Best Seat In The House.

Best of all, you can do it all today with the Micro Channel PS/2s you've already got. No special monitors to buy. And you'll be perfectly poised for tomorrow's most exciting multimedia technology, like interactive touch displays and much more. Contact your IBM Authorized Dealer or IBM marketing representative. Call 1 800 255-0426, ext. 10, for a free videocassette or a dealer near you. Your desk will never be the same.

For a free PS/2 MultiMedia demonstration videocassette call 1 800 255-0426, ext. 10
or send this completed coupon to: IBM Corporation
P.O. Box 92835, Rochester, NY 14692

Name_____

Title_____ Phone_____

Company_____

Address_____

City_____ State_____ Zip_____

☐ If you are a software developer, check here.

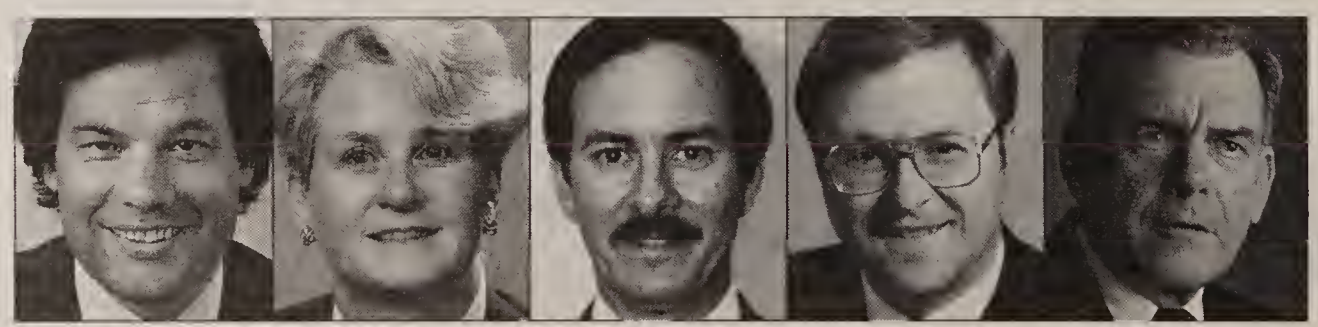
How're you going to do it?

PS/2 it!

IBM

IBM, Personal System/2 and PS/2 are registered trademarks and Micro Channel, Audio Visual Connection and M-Motion Video Adapter/A are trademarks of International Business Machines Corporation. ActionMedia cards are a collaborative effort between IBM and Intel. DVI and ActionMedia are trademarks of Intel Corp. © 1990 IBM Corp

To maximize the millions you've spent on computers, spend three days with us.



Michael H. Spindler
Executive Vice President, COO
Apple Computer, Inc.

Ellen M. Hancock
VP & Gen. Mgr. Comm. Sys.
IBM Corporation

Gary Stimac
Sr. Vice President
Compaq Computer Corporation

Michael R. Hallman
President
Microsoft Corporation

Charles E. Exley, Jr.
Chairman, CEO
NCR Corporation

Enzo Torresi
President, CEO
NetFRAME Systems, Inc.

Katherine M. Hudson
VP & Dir., Corp. Info.Systems
Eastman Kodak Company

Bill Bysinger
Dir., Information Systems
Aldus Corporation

Brigitte Morel
Vice President & Director
Dataquest Europe, SA

William Hasler
Vice Chairman
KPMG Peat Marwick

International TECHNOLOGY SUMMIT

Businessland is gathering the best minds of the industry to discuss the most pressing issues of the day—namely, downsizing corporate systems, client/server computing and the outsourcing issue.

And you're invited to pick the brains of the experts.

Our International Technology Summit will be held on December 5-7, 1990, at the INFORUM in Atlanta, Georgia, USA. Call 1-800-328-8383 for a conference brochure and registration information. It will be the most profitable three days you've ever spent.

BUSINESSLAND®

© 1990 Businessland Inc. Businessland and the Businessland logo are registered trademarks of Businessland Inc. All brand and product names appearing in this ad are registered trademarks or trademarks of their respective holders.

YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $38.95* per year — a savings of 62% off the single copy price.

First Name MI Last Name

Title Company

Address

City State Zip

Address Shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: $48 per year

* U.S. Only. Canada $110, Central/South America $130, Europe $195, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1. **BUSINESS/INDUSTRY** (Circle one)
   - **10.** Manufacturer (other than computer)
   - **20.** Finance/Insurance/Real Estate
   - **30.** Medicine/Law/Education
   - **40.** Wholesale/Retail/Trade
   - **50.** Business Service (except DP)
   - **60.** Government - State/Federal/Local
   - **65.** Communications Systems/Public Utilities/ Transportation
   - **70.** Mining/Construction/Petroleum/Refining/Agric.
   - **80.** Manufacturer ot Computers, Computer-Related Systems or Peripherals
   - **85.** System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
   - **90.** Computer/Peripherel Dealer/Distr./Retailer
   - **75.** User: Other _____
   - **95.** Vendor: Other _____

   (Please specify)

2. **TITLE/FUNCTION** (Circle one)

   IS/MIS/DP MANAGEMENT
   - **19.** Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
   - **21.** Dir./Mgr. MIS Services, Informetion Center
   - **22.** Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; Dir./Mgr. PC Resources
   - **23.** Dir./Mgr. Sys. Development, Sys. Architecture
   - **31.** Mgrs., Suprv. of Programming, Software Dev.
   - **32.** Programmers, Software Developers
   - **60.** Sys. Integrators/VARs/Consulting Mgt.

   OTHER COMPANY MANAGEMENT
   - **11.** President, Owner/Partner, General Mgr.
   - **12.** Vice President, Asst. VP
   - **13.** Treasurer, Controller, Financial Officer
   - **41.** Engineering, Scientitic, R&D, Tech. Mgt.
   - **51.** Sales & Mktg. Management

   OTHER PROFESSIONALS
   - **70.** Medicel, Legal, Accounting Mgt.
   - **80.** Educator, Journalists, Librarians, Students
   - **90.** Others _____

   (Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply)
   Types of equipment with which you are personally involved either as a user, vendor, or consultant.
   - **A.** Mainframes/Superminis
   - **B.** Minicomputers/Small Business Computers
   - **C.** Microcomputers/Desktops
   - **D.** Communications Systems
   - **E.** Local Area Networks
   - **F.** No Computer Involvement

E4047B-X

YES, I want to receive my own copy of COMPUTERWORLD each week. I accept your offer of $38.95* per year — a savings of 62% off the single copy price.

First Name MI Last Name

Title Company

Address

City State Zip

Address Shown: ☐ Home ☐ Business ☐ New ☐ Renew Basic Rate: $48 per year

* U.S. Only. Canada $110, Central/South America $130, Europe $195, all other countries $295. Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for this special rate.

COMPUTERWORLD

1. **BUSINESS/INDUSTRY** (Circle one)
   - **10.** Manufacturer (other than computer)
   - **20.** Finance/Insurance/Real Estate
   - **30.** Medicine/Law/Education
   - **40.** Wholesale/Retail/Trade
   - **50.** Business Service (except DP)
   - **60.** Government - State/Federal/Local
   - **65.** Communications Systems/Public Utilities/ Transportation
   - **70.** Mining/Construction/Petroleum/Refining/Agric.
   - **80.** Manufacturer of Computers, Computer-Related Systems or Peripherals
   - **85.** System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
   - **90.** Computer/Peripheral Dealer/Distr./Retailer
   - **75.** User: Other _____
   - **95.** Vendor: Other _____

   (Please specify)

2. **TITLE/FUNCTION** (Circle one)

   IS/MIS/DP MANAGEMENT
   - **19.** Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
   - **21.** Dir./Mgr. MIS Services, Information Center
   - **22.** Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm. Network Sys. Mgt.; Dir./Mgr. PC Resources
   - **23.** Dir./Mgr. Sys. Development, Sys. Architecture
   - **31.** Mgrs., Suprv. of Programming, Software Dev.
   - **32.** Programmers, Software Developers
   - **60.** Sys. Integrators/VARs/Consulting Mgt.

   OTHER COMPANY MANAGEMENT
   - **11.** President, Owner/Partner, General Mgr.
   - **12.** Vice President, Asst. VP
   - **13.** Treasurer, Controller, Financial Officer
   - **41.** Engineering, Scientific, R&D, Tech. Mgt.
   - **51.** Sales & Mktg. Management

   OTHER PROFESSIONALS
   - **70.** Medical, Legal, Accounting Mgt.
   - **80.** Educator, Journalists, Librarians, Students
   - **90.** Others _____

   (Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply)
   Types of equipment with which you are personally involved either as a user, vendor, or consultant.
   - **A.** Mainframes/Superminis
   - **B.** Minicomputers/Small Business Computers
   - **C.** Microcomputers/Desktops
   - **D.** Communications Systems
   - **E.** Local Area Networks
   - **F.** No Computer Involvement

E4047B-X

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 55 MARION, OH 43306

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

P.O. Box 2044
Marion, Ohio 43306-2144

There's no magic genie in a new system

BY LARRY STEVENS

It happens over and over again in business and industry. A company invests in technology expecting to increase productivity. It spends hundreds of thousands or even millions of dollars on equipment, months installing hardware and software and weeks training staff members. But the end result is an insignificant gain — far too little to pay for the equipment and installation costs.

Is the technology at fault? In most cases, no. The problem is more likely to be bad aim than a bad system.

Take the case of Northern Telecom, Inc.'s San Diego plant. Four years ago, it tried to increase productivity by installing an expensive and complex chip-handling station capable of receiving and processing on-line data from upstream equipment. Last year, plagued by increased time and expense to train operators to use the new station and seeing no change in productivity levels, the company ripped it out.

Problem identification

John Rolph, system specialist at the plant, explains that the workstation seemed to offer a temptingly easy way to eliminate the bottlenecks that were keeping productivity at the plant low. Unfortunately, the company hadn't analyzed the flow of materials before purchasing the equipment. Had it done so, it would have discovered that the bottlenecks resulted from other sections of the plant. Replacing a workstation that was one of the better-functioning pieces of the factory didn't help products move out the door any faster.

"We had a problem, and we had a solution," Rolph says. "The trouble was, the solution wasn't the right one for our particular problem."

Unfortunately, says Paul Berger, president of Paul Berger Consulting in Lawrenceville, N.J., that's not an uncommon predicament. In fact, it's minor compared with what can happen if the overlooked process problems are really serious.

Mark Green

Schlumberger's Peiser *says scattershot improvements fail*

What many companies fail to understand, he says, is that "information technology is not magic. If you have a poorly run company that puts technology in place, you'll end up with a poorly run company with expensive technology."

Most companies are finding that information systems investments are more likely to have a beneficial effect on productivity when the changes are carefully calibrated with improvements in work processes and organizational structures.

Schlumberger Well Services in Houston figured that out a few years ago, when it had to deal with the competing pressures of reduced profits and a more demanding market. During the mid-1980s, the Schlumberger Ltd. division, which builds oil well monitoring equipment, was facing losses resulting from a drop-off in oil exploration and decided to compensate by reducing its staff.

Recognizing that this kind of a move would be difficult at a time when both product complexity and the number of product introductions were increasing, the company decided to institute concurrent engineering, supported by a heavy investment in new computer-aided design and manufacturing (CAD/CAM) equipment.

According to Buddy Peiser, the company's CAD manager, the new equipment did increase productivity. It just wasn't enough, all by itself, to compensate for the loss of manpower.

Although the concurrent engineering effort had tightened the loop between engineering and manufacturing, there was still a breach between the business and manufacturing sides of the operation. With fewer hands to process the paperwork, engineering changes for special orders and new products were taking far too long to make their way from sales and marketing into the manufacturing process.

The missing link

Once the organizational deficit was identified, the company was able to fit an information system into the gap and achieve the kind of systemwide streamlining that was required. Working in concert with two vendors, Schlumberger developed a system called Engineering and Manufacturing Business Operating Systems (Emboss), which combined a Cullinet Software, Inc. MRP II system with a product information management system from Sherpa Corp. based in San Jose, Calif. Emboss merges the engineering bill of materials, associated product definition data and change process for product information.

Peiser says the number of engineering changes the plant can handle has quadrupled since the system was installed. "If you know what the problem is, technology can fix it," he says, "but you can't just go around installing equipment until you know how it's going to help you."

Possibly because of the pressure from foreign competition, most experts say that manufacturers have actually been more successful at analyzing organizational problems and installing appropriate technologies than other types of business.

Michael Rosow, executive vice president at the Work In America Institute, says that technologies such as CAD/CAM, inventory control systems in support of just-in-time manufacturing and MRP II systems have resulted in an average increase in productivity of about 4% per year in the manufacturing sector

Continued on page 103

Stevens is a free-lance writer based in Springfield, Mass.

INSIDE

Productivity on a personal level
Page 102

Measuring the good that IS does
Page 106

Personal managers: Pros/Cons

BY SCOTT KRAMER

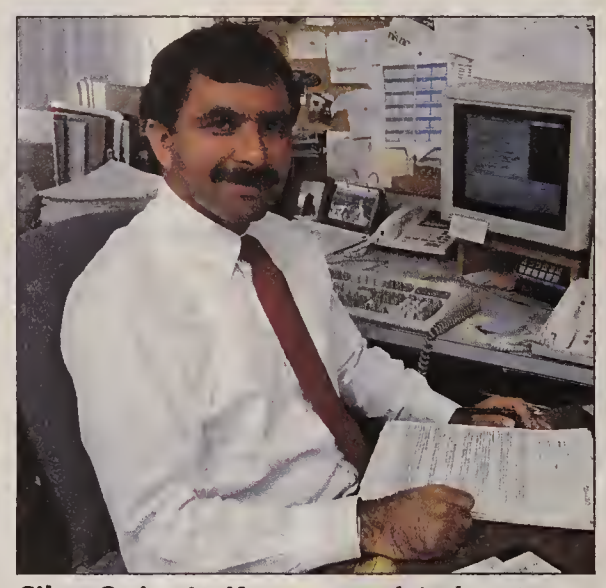
The search for personal productivity through better organization is assuming the proportions of a crusade for many businesspeople struggling to stay ahead of deadlines and on top of expanding lists of responsibilities.

Hollywood even got a script out of the phenomenon: The recent movie *Taking Care of Business* is the story of how a lost Filofax changes a power executive's life. And software companies have carved a substantial market out of personal computer packages that help individuals organize their working lives.

"I've been using Sidekick Plus for a total of three years now," says Mel Dittmann, president of Dittmann, Ryan and Associates, an executive search firm in Laguna Hills, Calif. "I rely on it 100%. I don't use paper at all."

Dittmann says the product, which features a calculator, a telephone autodialing feature, a DOS directory and an alarm system that goes off to remind him of appointments, provides him with everything he needs to organize his work life.

One of the most popular products of this type is Agenda from Lotus Development Corp. Ron Unger, chief executive officer of Intelligent Controls Corp. in Detroit, swears by Agenda, which he says has increased his productivity significantly. "The great thing about it for a person in my position is that there are an awful lot of balls in the air at one time. This package allows me to put them all in one place," Unger says.



Ciba-Geigy's Kantor *used to lose papers until he started filing them electronically*

Time gain is the biggest benefit as far as Bob Kantor is concerned. Kantor, manager of technology research at the pharmaceutical company Ciba-Geigy Corp. in Ardsley, N.Y., says since he started using Agenda, he no longer wastes precious minutes searching for meeting times or reminder notes on elusive scraps of paper. "Once I throw something in there, I know it's not going to get lost," says Kantor, who admits that he used to lose papers trying to manually file them into the appropriate slots.

Judy Housman, a Cambridge, Mass.-based consultant who leads the Boston Computer Society's Project Management Information Personal Management Club, says that many business people who think they need a project management package really need a personal information manager.

"A lot of people come to me and say they need a project management package," Housman says. "In fact, they don't, because they don't have a big project. They have lots of little things."

Although such products offer substantial benefits, there is still some room for improvement.

Housman says that although some products can run as programs within other programs, the toggling back and forth can become cumbersome. What users would really like, she says, is the ability to pull up information from these programs in pop-up windows within other applications.

Memory constraints can also be an issue. Some of these products work only in DOS and take up considerable portions of the operating system's limited memory capacity.

Yet another complaint is that some of these packages are too complex for relatively untutored computer users to figure out on their own.

Housman: *Pushes personal managers*

"We have not done a good job of providing easy, powerful tools for new users," says Bob Woolbert, a PC consultant based in Laguna Niguel, Calif. "I would suggest that they focus on putting the complexities of these packages in the background and making the ability to use that power more transparent to the users. We're beginning to see some of those things, but we're still not there."

In the meantime, it is best not to let users struggle in isolation, because enthusiasm can evaporate rapidly without some orientation. Unger, for example, although now a fervent convert, says that his initial reaction to Agenda was frustration. After trying to read through the manual, he gave up for a while until others in his office also bought the package and showed him just how easy it was to use.

Woolbert, like many others, uses several packages for both himself and his clients. He says they all have good points, but none can perform all the functions that may be desired.

One function Woolbert does find particularly useful is a computerized address and telephone directory from Day-Timers, Inc. in Allentown, Pa., which is essentially an on-line version of the company's popular organizer books. Not only does it do a good job of formatting names and addresses, he says, but it also allows you to import, format and print out files from Dbase on Day-Timers' forms.

One major group of users for personal productivity software is in the sales area.

Jerry Domagala, an account executive at Intelligent Information Systems, says the package he uses — ACT from Contact Software International — has had a positive impact on his sales effectiveness.

"Instead of having to worry about tickler files, I just push one button, and the program tells me what I need to do, what calls need to be made and when a person was called last," Domagala says. "I can also set up the software to prompt me to call certain people in a week, two weeks or a month," he adds. "It gives me sort of a paperless filing system, and that's great, because I hate to file." •

Kramer is a freelance writer based in Irvine, Calif.

Helper technologies for today and tomorrow

Although it is a mistake to regard information systems as a panacea, the right kind of systems in the right places can make a major difference in productivity. *Computerworld* asked four people who have spent a considerable amount of time working at the intersection of IS and business/industrial productivity to tell us what they regard as the best examples of current productivity enhancing technologies and which technologies they expect will have the greatest beneficial effects over the next few years.

Toby Choate
Arthur D. Little, Inc.

Present: The whole voice-response area has proven very effective, both in IS and for end users. It allows service organizations to respond to customers better. For companies such as banks and insurance companies, it's a good productivity tool. Routine calls such as address changes can be dealt with through voice response, while the person who would have handled those calls is free to handle more complicated requests.

Future: I see a lot of promise in imaging, not necessarily because of the storage issue, but because it allows you to reconstruct your work flow. When you can look at restructuring work processes, you start making real gains.

Another technology that I think will bring big gains is local-area networks. It's not a sexy technology, but it brings you into information sharing and allows your groups to work in different ways.

William A. Ruch
Arizona State University
Co-author of *Productivity and Quality: Measurement as a Basis for Improvement*

Present: While doing some work on productivity measurement, we dealt with operations centers in some commercial banks, where checks are sorted, processed and accounted for. One fellow told us that, working with what they had for equipment 10 years ago, there wouldn't be enough people in the U.S. labor force to process all the checks they now handle. The equipment allowed them to go from sorting several hundred checks per hour to sorting many thousands per minute.

Future: I don't really know. We've all read many times about the great claims made for technologies that would increase productivity, and they're frequently disappointing. Take a secretary with a typewriter who moves to a workstation with word processing and editing capabilities. Of course, she finds that she can do many more things. But now, her boss also feels freer to make corrections or additions, knowing that she can do that so much more quickly. In the clerical or informational area, it's difficult to measure output and thus very hard to tell if productivity and quality have gone up.

Paul Berger
Paul Berger Consulting, Inc.

Present: Rent-a-car companies such as Avis, Inc. and The Hertz Corp. have had success equipping attendants in return lots with handheld [computers]. The old process required the customer to record the mileage and gas, stand in line to report those figures and then wait while someone went to verify the figures. Now, someone goes out there with a handheld terminal as soon as the customer drives in and accomplishes the same thing in half the time.

Future: I'd have to say imaging. If you look at what you can do with direct entry of documents, it has to make a difference in how you use people. Also, machines such as handhelds and laptops hold tremendous possibilities.

Glover Ferguson
Andersen Consulting

Present: I know of an insurance company that got into cooperative processing. They were able to reduce the amount of time they spent processing applications from four days to less than one and cut the average time spent handling phone calls from 30 minutes to four. And that wasn't all: They also cut their error rate on misquotes by 70%.

Future: In terms of the future, I'd still pick cooperative processing, with the ability to support multimedia. When you're still doing linear processing, you have to structure your organization hierarchically and spend a lot of time passing a task through the various levels. With cooperative processing, what you end up with is a flatter organization and thus a lot of people with enriched jobs — more to do.

Continued from page 101

throughout the '80s. However, the U.S. as a whole has not fared as well. Rosow estimates that the service sector has declined in productivity at a rate of about 1% each year.

Because the service sector represents a larger share of our gross national product, productivity losses in that sector have dragged down the overall picture of U.S. productivity.

According to Rosow, the main problem with service companies is that, unlike manufacturing companies, "most service companies are organized with structures that were developed 50 or more years ago."

One service company that tried, and basically failed, to improve productivity using technology alone is IDS Financial Services, Inc. in Minneapolis.

As this insurance and financial services firm grew during the 1980s, it tried to use systems and software as a substitute for staffing increases. Although volumes were swelling, the company thought it could compensate for much of the added work load by adding new systems to increase the productivity of existing personnel. According to Susan Fagrelius, organization development consultant at IDS, when a department became overwhelmed with work, it often tried to solve its problems by computerizing another function or buying a newer version of software or hardware.

Although there were marginal productivity gains from these superficial fixes, Fagrelius says, the company was really playing a game of catch-up against impossible odds until it recognized its real handicap: a segmented functional structure that required too many people handling each piece of business. With that kind of structure, she says, delays, errors and service degradation were inevitable when the volume of business increased.

Three years ago, the company decided to change its organizational structure from function-driven to regional. Now, regional offices are capable of handling each piece of business from beginning to end.

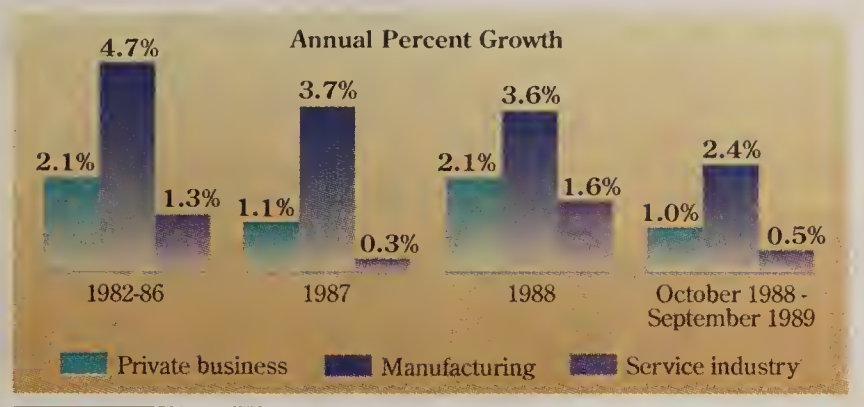
The only system change required to support this change of structure was to provide the regional offices with access to the company's database and to expand the number of users who had access to various parts of it. Before, for example, only the underwriting department would have had access to underwriting data. Now the entire office has to have access to most of the company's database. For the most part, this was a relatively simple matter of altering security procedures.

Fagrelius says that immediately after the changeover in September 1988, the company started finding out from customers and salespeople that their questions were being answered more quickly and more accurately. Furthermore, she says, the company is now able to process 17% more policies with 11% fewer employees — a productivity increase of about 30%.

Now that the organizational problems have been fixed at IDS, managers are again looking at IS for productivity improvement. The difference, Fagrelius says, is that this time computers won't be expected to do more than make a workable structure more efficient.

Recent reverses

Growth in U.S. labor productivity showed initial signs of recovery in 1988 but eroded during October 1988 to September 1989



Source: U.S. Bureau of Labor Statistics and American Productivity Quality Center
CW Chart: Doreen St. John

Aiming true

Technology can actually make structural changes possible, Berger notes. The trick, he says, is to make sure that you are looking in the right direction for the possibilities.

As an example, he points to a client who was trying to increase productivity by purchasing ever more sophisticated order-entry systems but to no avail. However, when the client eliminated the order department and instead placed a computer in the truck so that the driver could take and enter orders directly into the order-entry software, productivity increased.

When deciding whether to apply technology to a productivity problem, cost is always an important consideration. But David Adler, vice president of information services at AT&T American Transtech in Jacksonville, Fla., warns that strict adherence to traditional return-on-investment formulas may obscure the advantage a company gets from offering better service.

American Transtech provides telemarketing services for client firms. Recently, the company purchased Outbound Call Management (OCM) from its parent, AT&T. The system downloads telephone numbers from the client's lists and automatically dials the numbers at a rate based on the number of telephone salespeople on hand. When the phone is picked up at the other end, OCM immediately routes the call to the next available salesperson.

Time saver

Because salespeople do not have to dial the numbers manually, wait for the phone to be answered and deal with wrong numbers or busy signals, the system would obviously improve productivity. In fact, using a traditional measurement — number of calls divided by number of salespeople — productivity at American Transtech increased by between 30% and 50%.

The big question mark was cost. Not only was OCM expensive, but it also required a radical restructuring of the firm's computer system to allow downloading of telephone numbers and installation of new telecommunications equipment. If the company could make calls in half the time and still charge clients the same fee as before, the system would quickly pay for itself. Unfortunately, that wasn't the case. "We knew clients would insist on being charged less when a job that formerly took one month was reduced to only two weeks," Adler says.

This complication muddied the return-on-investment calculations, and it almost led American Transtech to delay buying the system. However, the company eventually decided to purchase it because, as Adler says, "providing better service to clients by getting their lists completed in half the time has to have long-term beneficial effects to our bottom line, even if we can't predict the exact payback period."

Investing in systems for productivity improvement has to involve more faith these days, says Joseph Izzo, vice president of the technology group at consulting firm A. T. Kearney, Inc. in Chicago. Most of the easy gains from automation have already been accomplished, and eking out further efficiencies requires a more sophisticated yardstick than the old formula: number of products divided by number of man-hours. Now, Izzo says, companies must adjust to the idea of productivity as a "gain from any means, including technology, that enhances your relationship with customers or shareholders."

These kinds of improvements, Izzo stresses, are less likely to be achievable by technology alone. "You can squeeze out a few percentage points of productivity increase by automating your accounts payable system," he says, "but if you reorganize your company's structure and then enhance that reorganization with technology, you might be able to raise the level of service to your clients. Sales will increase and so will productivity."

Jerry McAdams, vice president for performance improvement resources at Maritz, Inc. in St. Louis, agrees that the traditional labor-ratio view of productivity is no longer applicable to all situations. "If you improve service to your customer base, how much is that worth to your company? Everyone says 'a lot,' but you can't always measure the exact worth in terms of immediate profit and loss," he says.

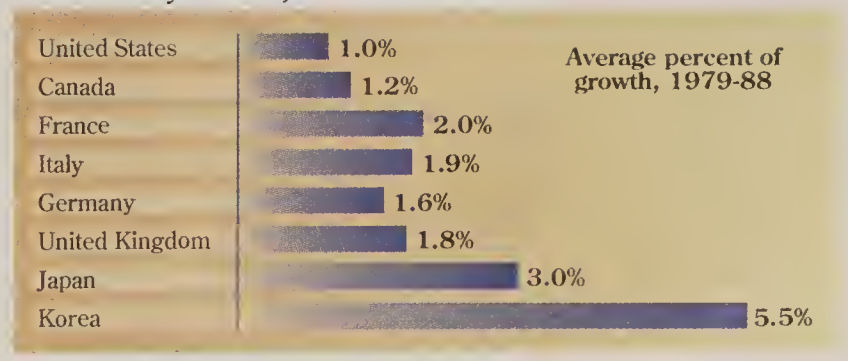
McAdams says he believes that companies sometimes have to be willing to be less dependent on quarterly figures. "Our nation is full of companies that are now in trouble because they decided they couldn't invest in a new technology unless managers could prove it would pay for itself in two years," he says.

There is little doubt that, in most cases, companies do derive some productivity benefits from technology in any form. But to become more competitive, companies have to be smarter than others using the same technology.

"Technology in itself will just keep you even," McAdams says. "If you could really solve all your problems by throwing money and technology at them, the richer companies would always win. It's not how much you spend on technology, it's how you use that technology that counts." •

World view

Although the U.S. continues to lead the industrialized world in labor productivity, its average growth in this area for the period 1979-1988 was lower than any other major industrialized nation



Source: U.S. Bureau of Labor Statistics
CW Chart: Doreen St. John

Catch-22

When productivity is lagging, time is a luxury few companies can afford. Unfortunately, when outmoded systems are part of the problem, the job of fashioning a fix often falls on an already struggling systems staff.

Bob Hunter, vice president of data processing at Max Federal Credit Union in Montgomery, Ala., says his company was caught in a catch-22 situation with an antiquated system that hampered staff productivity and kept programmers so busy, they had no time to think about writing new code.

He found his way out of the dilemma by purchasing Linc, a fourth-generation application generator marketed by Unisys Corp. that allowed him to create a new system in nine months. With the new, easy-to-maintain system in place, Hunter says, programmer productivity has increased by 25%.

Improvements in programmer productivity don't always translate into immediate productivity gain for the company as a whole, however. At John Deere Engine Works, Inc. in Waterloo, Iowa, for example, the struggle to overcome system deterioration caused by the Farm Belt economic troubles of the 1980s took roughly 2½ years.

Carlo Pensyl, manager of computer systems, says during that period, staff cuts in the IS area impaired ability to keep factory and business systems up to date. Acquisition of a VAX Cobol generator from Digital Equipment Corp. helped the systems staff considerably, producing an overall productivity gain of 20% for the department. That departmental gain eventually translated into improved productivity in other areas. Those results, however, took considerably longer to achieve than improvements in systems department output.

Why? Systems had already deteriorated to a point where many were falling to pieces, Pensyl says. "If we had more control over the order in which we developed new systems, we would have introduced them in a more logical manner."

LARRY STEVENS

The 486™ PC. It may be a little

486™ Never before has this much power been plugged into a business PC.

Presenting the Intel 486 microprocessor—a veritable powerhouse that's been harnessed for business.

A 486 microprocessor-based PC has everything it takes to run today's high-powered applications. And run them the way you need to—simultaneously and at lightning speed.

Plus, it's compatible with the hard-

©1990 Intel Corporation.

more power than you're used to.

ware and business applications you already own, so you won't spend any extra time or money on training.

The 486 PC. Plug it in and start shocking the corporate world.

For additional information, call 1-800-548-4725 and ask for "The 486 Microprocessor Means Business" brochure.

intel®

The Computer Inside.™

486 is a trademark of Intel Corporation.

Grading IS performance

Precise measures of systems staff productivity still elusive

BY KATIE CRANE

"Do more with less" is a chant echoing through information systems departments across the country, says Robert Rouse, assistant dean of the School of Technology and Information Management at Washington University in St. Louis. Systems departments are under intense pressure to increase productivity and produce clear evidence of that increase, he says.

Although he says the most telling measure may well be "a blood pressure test of the people doing the work," Rouse acknowledges that this reading probably wouldn't pass muster with senior managers and end users. Something more convincingly quantifiable is needed.

Finding a yardstick that is realistic and convincing is difficult. "Everyone is talking about measuring productivity, but virtually no one has succeeded in finding something that is both useful for the people doing the work and effective in demonstrating improvements to senior managers and end users," Rouse says.

Tom DeMarco, a principal at the Atlantic Systems Guild in Camden, Maine, says the pressure is resulting in some unhealthy productivity messages.

DeMarco suggests, for example, that slogans such as "work smarter, not harder" are usually productivity improvement gimmicks aimed at persuading IS to buy some methodology or tool. "Do it faster" (that is, meet an impossible deadline without spending any extra money) is another message that he says he believes costs dearly in the end, both in burned-out IS staff and sloppy results.

> "EVERYONE IS TALKING about measuring productivity, but virtually no one has succeeded in finding something that is both useful for the people doing the work and effective in demonstrating improvements to senior managers and end users."
>
> ROBERT ROUSE
> WASHINGTON UNIVERSITY

However, senior managers who have authorized millions of dollars for information technology for IS want to know if they are getting their money's worth, and that is not always possible.

Wayne Burkan, president of Alternative Visions in Farmington Hills, Mich., says he believes that "at least 90% of IS organizations have no productivity measure at all. And when they do measure it, they measure it in all the wrong places."

Too many IS organizations still measure things that are easily assessed — such as number of lines of code written, cost per CPU cycle or hours worked per project — instead of trying to evaluate how well they support the needs of the organization, Burkan says.

Therein lies the problem. How can IS professionals measure the productivity of essentially nonmeasurable areas, especially when their bosses are demanding a purely quantifiable response? Most agree that it can't be done, at least not perfectly. The new measures are immature and imperfect at best, but, says MIT's Chris Kemerer, criticizing such measures is not an excuse to avoid measurement. Burkan agrees: "We have to dump the old paradigm 'If it can't be measured accurately, we won't report it.' "

Thus, virtually everybody in this arena — academicians, consultants, professional associations and beleaguered IS executives — is searching for new ways to measure IS productivity.

Jerald Lauer, vice president of information services at Certified Grocers of California Ltd. in City of Commerce, Calif., uses a long list of "key measures" to assess the performance of the data center, support services, systems development and information planning. He uses an off-the-shelf software product called Microman II from POC-IT Management Services to plan, manage and assess the performance of his systems development staff and measures the data center on its service levels.

Kay Redditt, president of Cognitech Services Corp., an Easton, Conn.-based IS management consulting firm, suggests that such measures are good internal gauges but adds that IS must also weigh what she calls "business contribution" to answer the question, "Are we doing the right things?"

Cognitech is currently developing a measure of IS' ability to contribute to business goals, based on a variety of factors: architecture, IS management, day-to-day CPU operations, end-user support and the development, maintenance and enhancement of systems.

However, Burkan says he worries that too many IS organizations will jump into developing a huge reporting system to measure performance. Instead, he

Crane is a free-lance writer based in Norwich, Vt.

© 1990 NYNEX Corporation.

All too often, the technology that's allowed you to acquire so much information also dictates how you can use it.

But unless you're free to manage, access and share information the way you want to, you're not getting the most from your information system.

That's where NYNEX® comes in.

Because we're involved in virtually every aspect of the Information Industry, we can give you an unbounded look at the whole picture.

From cellular to software, from hardware to high-speed data highways, from

suggests organizing an in-house brainstorming session with IS and business users to devise unconventional measures and what he calls "intentional Band-Aid solutions," which he describes as "down-and-dirty" measures rather than refined ones.

John Musa, supervisor of software quality at AT&T Bell Laboratories, says he believes that any measure of IS productivity should factor in quality. A lot of people agree with him, he says, but no one has yet devised a concrete measure of the ratio of quality to cost with an eye toward achieving a proper mix of cost, delivery date and reliability.

For those who insist on more quantifiable approaches, John Henderson, professor of MIS at Boston University, is among a group of academicians researching a productivity modeling approach called Data Envelopment Analysis, and MIT's Kemerer has just finished a study on function points, which he calls "a more user-understandable output measure" originally developed by Allan Albrecht at IBM in 1979.

All in all, DeMarco estimates there are probably a half-dozen perfectly good ways to measure productivity, but all are expensive, which is why IS avoids them.

Avoidance of measurement may not be a viable option for much longer, however. Between the rising tide of executive interest in outsourcing and tightening budgets, Burkan and others say the pressure is on IS to prove what it does and how it delivers benefits. •

Working in the here and now

Merrill Lynch takes street-wise approach to IS measurement

Raj Nigam, chief scientist in the Management Science Group at Merrill Lynch & Co. in Somerset, N.J., regards himself as a "street fighter" when it comes to trying to measure what information systems really accomplish.

Unlike academicians, who can spend time mulling large theoretical concepts such as IS productivity, Nigam says his approach is nitty-gritty tactical. "We're just measuring input and output, not whether that amounts to productivity," he says, "but my feeling was that we needed to get something done, get something simple in place."

Nigam was handed the task of devising a means of measuring the IS contribution at Merrill Lynch just over one year ago and quickly decided that simplicity should rule the process.

"If you put 10 applications developers into a room and let them brainstorm the factors that could be used to measure them, you would very quickly generate hundreds of measures," he says. "A manager can get lost in that. You can draw graphs until you're crazy — color graphs, three-dimensional graphs — and not know what they mean."

Nigam decided instead to assemble a small team of seven systems managers to look for no more than 12 variables that could be measured. He limited the project to three months.

After three months, the team had accumulated 15 measures. Bending his numerical limit, Nigam decided to keep all 15, breaking them into what he describes as a "Chinese menu" consisting of one list of measures that could apply to many groups and another list to accommodate the different styles and emphases of some departments.

The idea, Nigam says, was for departments to be able to pick and choose from the two lists but to also be encouraged to select more of their measures from the first "core" list to ensure some consistency.

Categories for everyone

There are six basic categories of measurement that carry across both lists, according to Nigam. They are the following:

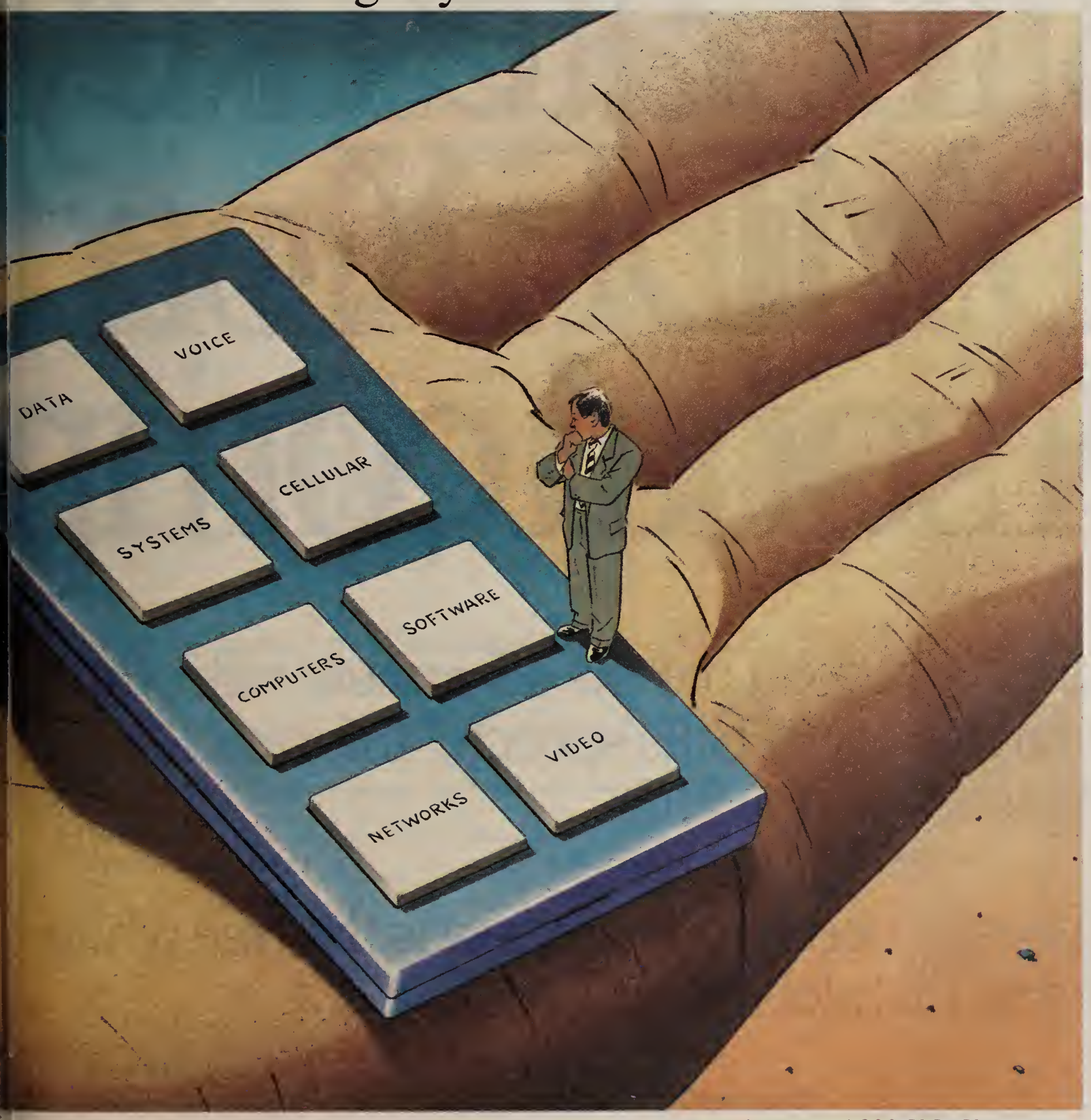
- Bottom-line measures — percentage of commitments met on time and on cost, dollar value of benefits received and percentage of projected benefits received.
- Data orientation — how much data is shared across multiple applications (with the idea that data sharing is an indicator of productivity).
- User satisfaction measures.
- Technical quality measures, such as whether good practices were used in coding or whether documentation meets industry standards.
- Technology penetration — the kinds of tools being used and how often they are used.
- Staff-support-level measures, such as code lines per developer (by language), code lines per maintenance person, skill inventories and staff satisfaction.

Heavy debate broke out during the planning process over use of function points vs. lines of code, Nigam says. "We ended up choosing lines of code by language, acknowledging that we would probably argue another day over whether or not to switch to function points. For the time being, however, there are programs that will do this automatically, and both cost and getting the program going were issues," he says.

Expediency also influenced the decision to stick to measures that focused on departments rather than individual application developers and programmers. "As time goes by, we will have a set of measures tailored to each group," Nigam says, "but right now, we're looking for partial coverage — not to solve the whole problem at once." •

KATIE CRANE

We give you freedom of information.



token rings to teleconferencing, from video to voice recognition, we offer the kind of freedom of choice in solutions that can really free up your information.

That's why scores of businesses, institutions and governments around the world have come to depend on NYNEX for their information needs. Call us at 1 800 535-1535. For solutions that will set you free.

Need to communicate? Need to compute? The answer is

NYNEX

Don't ask me w
Bill Gates' key
COMDEX on t
personal comp

☐ So please, just send me the 45-minute videotape and white paper of Bill's speech, "Information At Your Fingertips™" for $10.*

☐ Actually, all I need from you now is the free white paper and I'll take it from there.

*Includes shipping and handling; applicable taxes not included. VHS format only. Allow 4 to 6 weeks for delivery. Offer good only in the 50 United States. In Canada, call (416) 673-7638. ©1990 Microsoft

I've got to have a copy of Bill Gates' keynote at COMDEX on the direction of personal computing in the '90s!

☐ So please, just send me the 45-minute videotape and white paper of Bill's speech, "Information At Your Fingertips™" for $10.*

☐ Actually, all I need is the free white paper, and I'll take it from there.

To receive the white paper, check the appropriate box and drop this pre-paid card in the mail.
Or, call (800) 541-1261.

To order the videotape, please complete the following information.

1. Shipping information *(please print)*

Name Company

Address *(no P.O. boxes, please)*

City State ZIP

( )
Daytime phone *(in case we have a question about your order)*

2. Payment method

☐ MasterCard ☐ VISA

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Please print credit card number in space provided.

Cardholder's signature

Expiration date

*Includes shipping and handling; applicable taxes not included. VHS format only. Allow 4 to 6 weeks for delivery. Offer good only in the 50 United States. In Canada, call (416) 673-7638. ©1990 Microsoft Corporation. All rights reserved. Microsoft and the Microsoft logo are registered trademarks and *Information At Your Fingertips* is a trademark of Microsoft Corporation.

CW 11/19

Microsoft®
Making it all make sense™

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO. 108 REDMOND, WA

POSTAGE WILL BE PAID BY ADDRESSEE

MICROSOFT CORPORATION
DEPT 1116
ONE MICROSOFT WAY
REDMOND WA 98052-9953

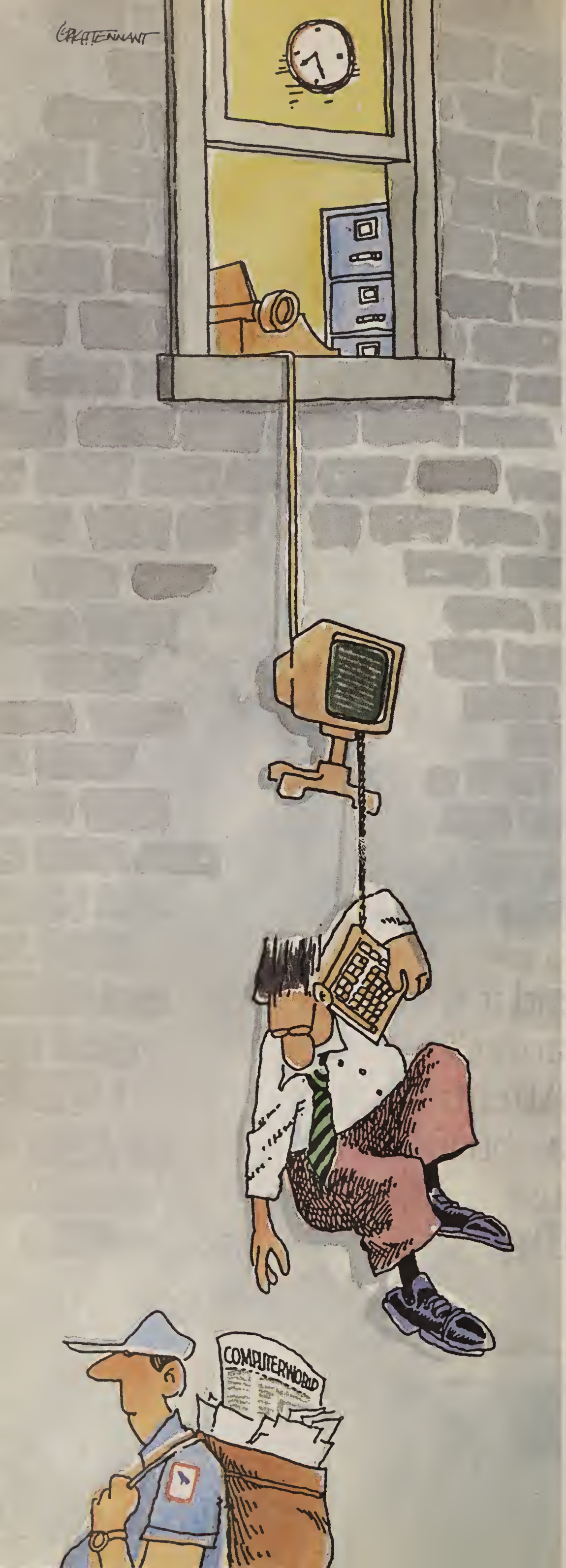
hy, but I missed note speech at he direction of uting in the '90s.

Fill out this ad, and send it with your name and address to Microsoft Corporation, One Microsoft Way, Redmond, WA 98052-6399, Attention: Dept. #1116.

Or simply complete the business reply card. To order by telephone, you can just give us a call at (800) 541-1261.

Microsoft®
Making it all make sense™

poration. All rights reserved. Microsoft and the Microsoft logo are registered trademarks and Making it all make sense and Information At Your Fingertips are trademarks of Microsoft Corporation.



There's no end to how far people will go to get COMPUTERWORLD first.

Do you risk life and limb each week to be one of the first in your company to nab the office copy of *Computerworld*?

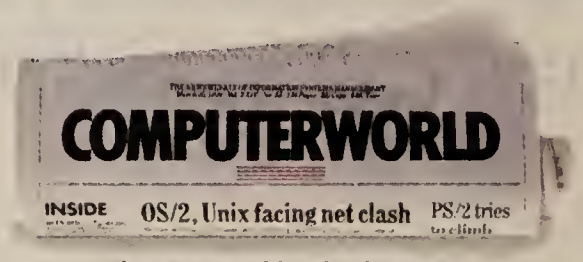
Well now there's a better-and safer-way to get the latest, most up-to-date news in the information industry, hot off the presses.

Subscribe to *Computerworld* and receive 51 issues of the best-read publication in the information industry. Plus, you'll get our special bonus publication, *The Premier 100*, an annual profile of the top companies using information systems technology.

There's no need to wait days before your company or department subscription reaches your desk. And there's no need to go to extremes just to be among the first in your company to read about the products and people, trends and technology, issues and information that shake the IS community each week.

Just use the postage-paid subscription card bound into this issue. And get your own copy of *Computerworld*.

Why take chances?



The Newsweekly of Information Systems Management

Before you burn out, chill out

Ward off IS stress by kicking back, accentuating the positive and being a good communicator who's open to change

BY ALAN J. RYAN

Second in an occasional series.

Thinking about taking a dive off the top floor of corporate headquarters? Why not do a double gainer in the company swimming pool instead?

To help employees — including information systems professionals — deal with stress, more and more companies are offering programs such as physical fitness centers or discounted health club memberships, stress and time management seminars, rotation of assignments, counseling and support services.

For instance, Trump Plaza Hotel and Casino in Atlantic City offers managers a health spa, as well as stress reduction classes and executive development seminars. Paine Webber, Inc. offers a corporate health club at its new IS and operations headquarters in Weehawken, N.J. Other firms have similar programs.

"Some companies have traditionally paid more attention to the health of their workers through stress management programs," says Christine Bullen, assistant director of the Center for Information Systems Research at MIT's Sloan School of Management in Cambridge, Mass. "But we don't yet have all the answers on how to manage stress."

Computerworld asked IS professionals other ways in which they handle new pressures to supplement corporate services and programs. They give the following advice:

• **Learn to play politics.** The first step toward dealing with stress is finding its cause, says Steve McMahan, managing director at Source EDP, a placement agency in Boston. For IS personnel, in many cases, the cause of stress is interpersonal communications.

"Systems people have often had the attitude of 'If I do good technical work, I don't have to play politics, and it is not that important that I get along with my boss,' " McMahan says.

But as systems work becomes more a means to an end — like any other business tool — and less of an anomaly unto itself, McMahan says, workers will have to start learning to deal with political stress. His advice? "Work with user constituencies; develop relationships with your managers. That is the way to deal with the external, organizationally induced stress."

Manuello Paganelli

James River's Miller *says IS people often put pressure on themselves to reach unrealistic goals*

• **Be open to change.** As any experienced IS professional knows, in technology, nothing stays the same for long. Accepting almost constant change as a fact of life can go a long way toward reducing daily pressure, interviewees say.

"People who do not handle change well are prone to burnout," notes Karl Swanseen, director of MIS at Trump Plaza. "In the MIS field, you have to be wide open and ready to change at a moment's notice. You have to be extremely flexible and open-minded, and you can't treasure the works of the past."

The real test is to keep a chin up in the toughest situations.

"The hardest part is when you invest a lot of time and energy in a project and hit the specs right on, but then the market changes, and the industry changes so that your work becomes obsolete," Swanseen says.

• **Be realistic.** Deadlines are often cited as a big stress inducer. To avoid that, "we try to stress good problem definition on large projects," says Richard Hock, director of MIS at Echlin, Inc. in Branford, Conn.

• **Remember, you're not a solo act.** Unlike in the old days, teamwork is now more common in many IS shops, notes John W. Owens, vice president and chief information officer at Sara Lee Hosiery, a division of Sara Lee Corp. in Winston-Salem, N.C. That's good news.

Owens says the IS profession has matured substantially in terms of leadership and teamwork during the last decade.

"Hopefully, it is no longer an

Ryan is a *Computerworld* senior writer.

individual who is in the hot seat and under intense pressure to produce something over an extended period of time," Owen says. "The person has at his disposal support resources and linkage to other parts of the team or other departments within the organization to help alleviate that."

• **Accentuate the positive.** While downsizing, globalization and the greater prominence of IS can all create stress, IS veterans point out that many benefits accompany such pressures.

> "PEOPLE WHO DO not handle change well are prone to burnout."
>
> KARL SWANSEEN
> TRUMP PLAZA

A bit of new pressure is not necessarily bad, Trump Plaza's Swanseen notes: "It just adds a lot of color and excitement to the work; it makes you that much more energetic in achieving your goals."

It's also important to realize that life in IS is less stressful in many ways than it was 10 years ago, Owens adds. "Things today generally are better, from the standpoint of having a clear vision of what needs to be done and being better at producing the result."

Patricia Wallington, vice president and chief information officer at Xerox Corp.'s U.S. Marketing Group in Rochester, N.Y., adds: "Many people in the past were frustrated by the ability to really have that direct value added to the business. That's changed."

• **Cut yourself some slack.** Ten years ago, many pressures on IS came from the outside, such as users asking how long the backlog for new applications might be, says James C. Miller, vice president of information technology at James River Corp. of Virginia in Richmond.

Today, Miller says, IS workers often pressure *themselves* — often in the name of helping the business. "Now, it's more like, 'If I can get this done six weeks early, I'll be able to help my business in Detroit get this product out,' or 'I can do this for the bottom line and get more earnings per share.' "

Keeping a realistic, balanced attitude about what you can do is key, Miller and others advise.

• **Realize that you've got plenty of company.** Sure, being in IS sometimes means 10-, 12-, 14-hour and longer work days. But, for whatever consolation it's worth, so do many other professions.

"There are still extremes, but overall I doubt that our profession has to work more hours than most other business disciplines," Owens notes.

"I don't think that we experience any different pressures than the rest of business," Wallington adds. "Everybody has to learn different things."

• **Take time off.** "The best release is taking time off and getting away," Swanseen says. "I think there should be more vacation time or free time available to limit the stress."

• **Know your limits.** Brian Camenker, a senior analyst at Dynamics Research Corp. in Wilmington, Mass., says that most systems workers know their limits, and if they work within them, they will not face job burnout.

• **Get more training.** IS professionals say that two of the biggest sources of stress are not knowing enough to get the job done and the fear of falling behind technologically.

As a result, they advise taking as many continuing education courses and seminars as time permits and encouraging companies to support them. "Companies need to be willing to give more time to train people," MIT's Bullen says.

Learning the business and dealing with attendant pressure *increases* your value as an employee, reminds Paul Berger, president of Paul Berger Consulting and PBC Management Video Programs in Lawrenceville, N.J. Learning new areas is "an opportunity to add value," he says.

• **Do better career planning.** For many IS professionals, stress comes from unhappiness with their career paths.

In the late '70s and early '80s, people flocked to the IS field because there were jobs, Source EDP's McMahan says. "Those are the people who tend to be in our office after they have been in the field for two to five years saying, 'I'm sick of what I do. I don't want to program any more.' "

McMahan says many of those workers want to remain in the computer field but move out of technical work. "That might be burnout," he says, "or maybe just call it people who were doing something they never liked in the first place."

It's a tough question, but it might be valuable to ask yourself: "Is IS really the field for me?"

Stella Johnson

COM/Energy's Straehl *sees her staff struggling to keep work/home balance*

• **Look for the "right" company.** If possible, finding a culture that matches your own personality and managers who reflect your values can eliminate a great deal of friction, IS veterans say.

"Take a good hard look at yourself and the environment you're working in, and make sure the environment, department and company are consistent with who you are," McMahan says.

• **Keep in touch with users.** Since a lot of stress comes from interaction with end users, IS managers advise nipping potential pressure and conflicts in the bud.

"It is important that managers at all levels get out and find out what users want and what they are looking for," Echlin's Hock says. "Whenever I have a meeting," he adds, "I make it a point to go to see the user rather than have him come to my office." •

Struggling with juggling IS career and family life

BY ALAN J. RYAN

It's 8 p.m. Have you seen your children today?

If you anwered no, you are not alone, unfortunately. Of the numerous stresses on information systems life today, among the greatest for many professionals is the conflict between job and family.

While IS workers are not alone in facing these issues, several factors — including work that often requires long hours and a comparatively young work force in or approaching child-bearing years — make the pressures for many even more acute.

"A lot of employees are in a balancing act between the issues of advancement and compensation and their personal lifestyle, professional life, family life and social life," says Patricia Wallington, vice president and chief information officer at Xerox Corp.'s U.S. Marketing Group in Rochester, N.Y.

The 1950s' — or even 1970s' — vision of domestic life no longer exists, a fact to which any IS worker can attest.

Jean Straehl, manager of distributed IS at COM/Energy Services Co. in Cambridge, Mass., for instance, tells of an employee who got a call from his child's day care center. The message was: *Come pick up your sick child.*

"He had to go home because his child had chicken pox and then had to come back in later when his wife got home from work," Straehl recalls.

Any working parent can relate similar stories. All of this begs the question: What do people do to balance their careers and family lives? Do companies help? Must there be a trade-off between work and family?

More flexibility

Fortunately, more U.S. companies are finally realizing that domestic peace and worker productivity are closely linked and are therefore offering part-time positions, telecommuting options and job sharing, which IS workers are increasingly taking advantage of.

"To a great extent, having productive people on the job is a function of keeping their family happiness intact," says James C. Miller, vice president of information technology at James River Corp. of Virginia in Richmond, Va.

Many companies also offer flexible work hours to accommodate working parents and others who simply do not want to work the traditional nine to five. At Xerox, for example, a study is now under way to examine relationships of work and family and how they affect individual workers.

"Empowerment is a big piece of the management policy here," Wallington says. "It's up to the manager to work with the employee." She says many of the Xerox IS workers are on flex time. "We try to help them to balance their lifestyles but not to make those decisions for them."

Miller says that James River tries to be flexible in order to meet the needs of the workers. Some options at James River — done on a case-by-case basis — include giving workers personal computers to work on from home doing applications development, allowing full-time workers to reduce their hours so they can spend more time with their young children and allowing some workers to move into less demanding jobs where they will not need to put in extra hours on a regular basis, Miller says.

For example, Miller explains: "If you're a technical manager today and you want to work part time, you may have to become a technician again, and we can put you on three days a week."

Things get tricky, he adds, because family happiness means different things to different workers. "There are individuals who can work 60 hours a week and maintain family happiness and there are others who look at 40 hours and cannot go beyond that."

The key, he says, is that management must respect all types of workers. "You'll find good [information technology] people at both ends of the spectrum," he adds. "We don't tell people to do this or behave this way. We have a constructive tolerance for diversity."

In companies without formalized programs, IS employees make their own decisions about the best ways to strike the right balance between work and family.

In the case of Karl Swanseen, director of MIS at Trump Plaza Hotel and Casino in Atlantic City — and father of three children, including a newborn — the choice is to break up the work day.

Swanseen works between 9 a.m. and 6:30 p.m. every day. "When I go home, I play with the kids for a couple of hours, and I put them to bed," he explains. "I may work after that." But he makes it a point to spend quality time with his family on weekends.

Is there a parent track?

While many workers may like flexible working options, placement officials say having a flexible firm is anything but a guarantee for a high-paying job.

"The firms that often pay the best salaries and have the biggest bonuses — such as brokerage firms — have the longest hours," says Steve McMahan, managing director at placement firm Source EDP in Boston.

At the same time, a laid-back, family-oriented company is not likely to pay as well as the brokerage firms, McMahan says. Workers looking for new jobs must understand the trade-offs and prioritize what is important to them, he says, "because you don't get it all." •

NATIONAL
BRIEFS

Pardon my pleadings

Whether the threat of war can serve to hasten peace in the Middle East remains to be seen, but the strategy certainly worked last week in the Pacific Northwest. In one of the quickest revolving-door circuits in recent memory, **Microsoft Corp.** and **Z-Nix Co.** last week settled the Windows-based licensing dispute that Z-Nix made a federal case of only days earlier [CW, Nov. 12]. The out-of-court accords provide Z-Nix with a Windows license through 1991 and Microsoft's pledge to good-faith discussions of renewal this time next year.

Shape of things to come

Cost-cutting measures announced and implemented earlier this fall at Los Angeles-based database vendor **Teradata Corp.** will not go far enough to keep the company from a work force reduction it hoped to outrun, according to company Chairman and Chief Executive Officer Kenneth Simonds. Following a series of meetings during which board members and executives took a long look at the looming recession, Simonds said that the firm will escalate its assault on expenses to include, among other moves, a 10% to 12% work force cut. "We believe these actions are necessary to return us to profitability," Simonds said, adding that hopes for the company's near-term growth would be overly optimistic.

More briefs on page 117

CALS makes impact on imaging technology

BY GARY H. ANTHES
CW STAFF

An image processing and document management program conceived by the U.S. Department of Defense is sending ripples through the computer industry, giving momentum to a host of new standards, technologies and products. And the Computer-Aided Acquisition and Logistic Support (CALS) program is beginning to shape the future of computing in industries far removed from the Pentagon.

CALS was launched in 1985 in response to the skyrocketing volume and cost of paper used in the design, manufacture, acquisition and maintenance of weapons systems. The program was intended to implement existing standards — and to foster the development of new ones — for the electronic transfer and integration of technical data.

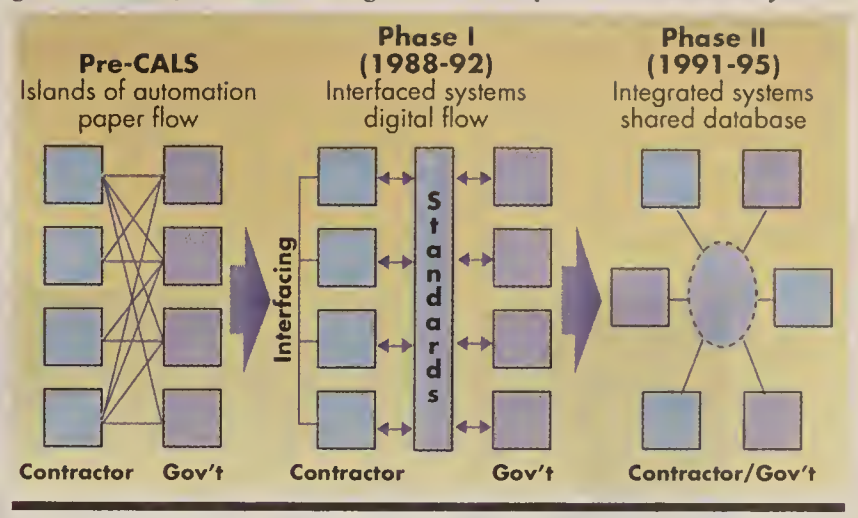
Now, well into the first phase of the two-phase, 10-year program, that effort is beginning to yield results. Defense contractors, whose paper problems mirrored the military's, embraced the concept, as did a host of computer hardware and software vendors eager for a new piece of the multibillion-dollar weapons business. And for users, CALS promises a long-sought benefit as its standards lead vendors to create interoperable products at competitive prices.

By one estimate, the government and its contractors are currently spending $2 billion per year to make their systems CALS-compliant. In addition, as the program has built up momentum, it has begun to spin off products and know-how into the commercial sector. "CALS is spurring the development of tools and methodologies no single company can afford to do by itself," said John Bottoms, president of Avalon Systems, Inc.

Interleaf, Inc., for instance, introduced a suite of products to support so-called "information publishing," including documents that can access, evaluate and act on information.

Beyond the paper chase

An imaging initiative 10 years in the making could revolutionize government information management – and spawn a mini-industry



Source: National Computer Graphics Association — CW Chart: Paul Mock

Now, according to Paula Angerstein, program manager for publishing standards, Interleaf is getting requests for the same capabilities from commercial air-

Continued on page 116

SPSS fuels growth with outside funding

BY MICHAEL FITZGERALD
CW STAFF

CHICAGO — For the first time in 20 years of funding its own growth, $34 million statistical software vendor SPSS, Inc. has gone outside for capital, selling more than 30% of the company to an investor group headed by Morgan Stanley Venture Capital Fund L.P. Terms of the deal were not disclosed. However, observers estimated that it brought $6 million to SPSS.

Norman Nie, president, chief executive officer and co-founder of the company, said that the deal, which was in the "multimillions" of dollars, would let SPSS do three things: build a new set of "visually-oriented" products across its product line; develop statistical applications for large, specific markets such as manufacturing; and help SPSS expand its support efforts.

Nie also said that SPSS would likely use some of the funds to acquire another company or develop new strategic business partnerships.

Growth critical

Gary Madden, an analyst at Dataquest, Inc., speculated that SPSS hit the point at which growth was more critical than total control.

"I think they're seeing that the applications for [statistical] software have become much broader, and they probably need to do a lot of investment to support the [product]," Madden said, adding that moving toward a visual or graphical user interface will be important for SPSS because of the intensive alphanumeric nature of its package.

Nie will remain the firm's largest single shareholder, and the SPSS senior management group will remain its largest equity holder. SPSS will add four seats to its board: two for Morgan Stanley, one for Cooke & Andrews Investments, Inc., an affiliate of SPSS' Japanese partner, Japan Systems Engineering Corp., and one that will be filled by Bernard Goldstein, head of Broadview Associates, an affiliate of Geocapital Partners, which contributed approximately $1 million to last week's fund. Westinghouse Credit Corp. provided the bulk of the funding for the deal.

INFOMART FROM APPLE TO XEROX.

INFOMART is where you can see and evaluate the latest in information and communications technology. From more than 100 companies like Apple, Andersen Consulting, AT&T, EDS, Epson, GTE, IBM, NCR, Novell, Texas Instruments, Xerox and many more.
Call today to get your free 72 page INFOMART Directory. It's the easy way to make your visit to INFOMART even more productive.

Call today to get your free directory. 1-800-232-1022

INFOMART®
Where the leaders in automation share their knowledge with you.

INFOMART. 1950 Stemmons Freeway, Dallas, Texas 75207 INFOMART is a registered servicemark of IFM partnership.

A new lease on life for Leading Edge

BY RICHARD PASTORE
CW STAFF

WESTBORO, Mass. — One year out of Chapter 11 reorganization, Leading Edge Products, Inc. has remade its dealer channel and appears to be on target in products and profitability, according to analysts. Former users, in the meantime, seem willing to give the firm a second chance.

"Leading Edge has come a long way," said Mark Levitt, an analyst at International Data Corp. in Framingham, Mass. Acquired last year by South Korean conglomerate Daewoo Telecom Co., the company has made the rebuilding of its dealer base its highest priority, Levitt said. Starting the year with as few as 400 dealers, the firm has 2,300 today.

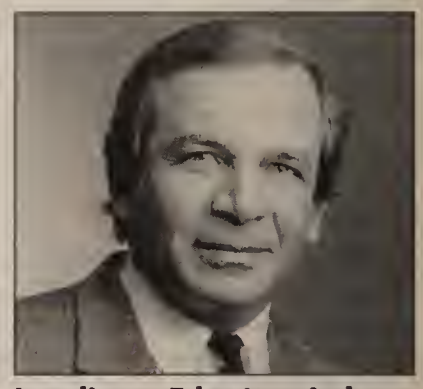
Leading Edge used to rile dealers by demanding advance payment for undelivered equipment, analysts said. New Chief Executive Officer Albert Agbay, in contrast, handles dealers with kid gloves. One example is his cautious approach to the superstore phenomenon.

"We have to pick a channel and be loyal to it," Agbay said, noting that the fast-growing cut-rate superstore channel is attractive, but the firm will not participate at the risk of souring its dealer relationships.

Agbay has other concerns — mainly, how to follow the profitable month of September (its first in 18 months) with a profitable fourth quarter and 1991 fiscal year. "We'd like to be profitable for 1991 and surpass Leading Edge's best year in revenue," which in 1987 was $150 million, Agbay said. This year will see $100 million in revenue and unit sales of 65,000 to 70,000, he predicted.

Agbay said he hopes to get there with, for instance, lower priced products that will sell in a sluggish economy: Intel Corp. 80386SX- and 386DX-based desktop and portable computers.

Users who have bought from Leading Edge in the past seem



Leading Edge's Agbay: *Pick a channel and stay loyal*

receptive to the new lines. "The main reasons we stopped buying them is because they went out of business for a while, and we had problems with their 30M-byte disk drives," said Richard Norlin, data processing manager at TSI Mason Research Institute in Worcester, Mass.

Norlin said he would reconsider Leading Edge, but the company would have to beat the price and performance of the NEC Technologies, Inc. machines he is currently buying.

In addition to profits, Agbay's main goal for next year is to close some of the gap between Leading Edge's time to market and that of its competitors.

"We accept the fact that Leading Edge will not be leaders in technology," Agbay said, but he wants to reduce the present nine- to 12-month lag time to market to three months or less. Products late to market must attract attention with shockingly low pricing, cutting deeply into profit margins, Agbay said.

The average price for a Leading Edge PC was running about $1,100 in September. The company has labored this past year to build a little more margin into the higher end products and has succeeded in raising the average system price tag from January's low of $600. However, despite the price boost, the firm still heavily undercuts its competitors. Leading Edge's 386SX-based Model D3M10WV sells for about $2,000 less than a comparable IBM Personal System/2 Model 65 SX.

© Eastman Kodak Company, 1990

The paperless office is a myth. The information challenge for the future—necessarily—is to manage the image of that paper swiftly, economically, electronically.

Is the handling of paper-based information holding up your time-sensitive office operations? Use an electronic image and our application-specific work-in-process software, and Kodak electronic imaging systems can help you streamline and manage the process. Print it. Fax it. Suspend it. Route it. By freeing you from paperwork, Kodak imaging systems can reduce file space and look-up time, and bring you the benefit of a totally integrated information environment.

We have more than 60 years of business imaging experience to share. Ask your KODAK Business Imaging Systems representative how image management can benefit your information management. ***Call 1 800 445-6325, Ext. 331.***

MANAGE THE IMAGE. CALL KODAK

The new vision of Kodak

Get ready for a rough ride

Analysts predict difficult move to client/server computing

BY JOHANNA AMBROSIO
CW STAFF

STAMFORD, Conn. — Get ready for a teeth-gnashing, roller-coaster decade as users make a painful transition to a networked, client/server computing environment. Also prepare for massive confusion among users and vendors alike over what choices to make and when to make them.

Such was the vision painted at a press conference last week by Gartner Group, Inc. analysts, who offered their prognostications about what the coming 10 years will bring.

By far, the biggest single influence in the industry will be the adoption of a new "master platform" — IBM's System/390 mainframes, said Bruce Rogow, Gartner Group's executive vice president. "This will evolve over the next five years and will be extremely crucial to everyone in the industry," he said.

However, because "maybe we waited a little too long" for this new platform, the information technology industry may only grow in the single digits during the next two years as user organizations assimilate the 390, Rogow said.

> BY FAR, THE biggest single influence in the industry will be the adoption of a new "master platform" — IBM's System/390 mainframes.
>
> BRUCE ROGOW
> GARTNER GROUP

Information technology's status as the single largest component of capital expenditures will decrease as the economy worsens, Rogow added. "I don't see the executives I've talked to, given the economics of 1990 and 1991, ready to increase [information technology] expenditures," he said.

Another negative factor, at least from an industry point of view, is the move toward open systems.

"Unix is bankruptcy spelled in Esperanto," Rogow said. Because vendors' margins are so low on nonproprietary systems, a big demand for them might "create a bloodbath," he said.

As an alternative, Rogow said, vendors are likely to use new applications such as imaging and cooperative processing to provide "a proprietary approach to openness."

Jim Cassell, a Gartner Group vice president and IBM mainframe analyst, said that the 390 is also critical for helping information systems managers "regain control of enterprise computing." Currently, he said, as much as 50% of electronic information is on the desktop and out of the purview of IS.

IBM will build on the 390's newly announced Sysplex architecture to become a "megaplex" — connecting all the mainframes and client/server computers throughout an organization. The mainframe will essentially become a "superserver," Cassell said.

Still, he added, "for a long time the legacy is on mainframes. It will take quite some time for client/server to become the predominant model." Mainframe capacity will continue to grow 30% per year, he said.

Cassell also said that he expects IBM's 390 base processor to run at least as fast as Hitachi America Ltd.'s does — a reported 45 million instructions per second (MIPS). The 390 was announced at 40 MIPS because IBM was being overly cautious, he said.

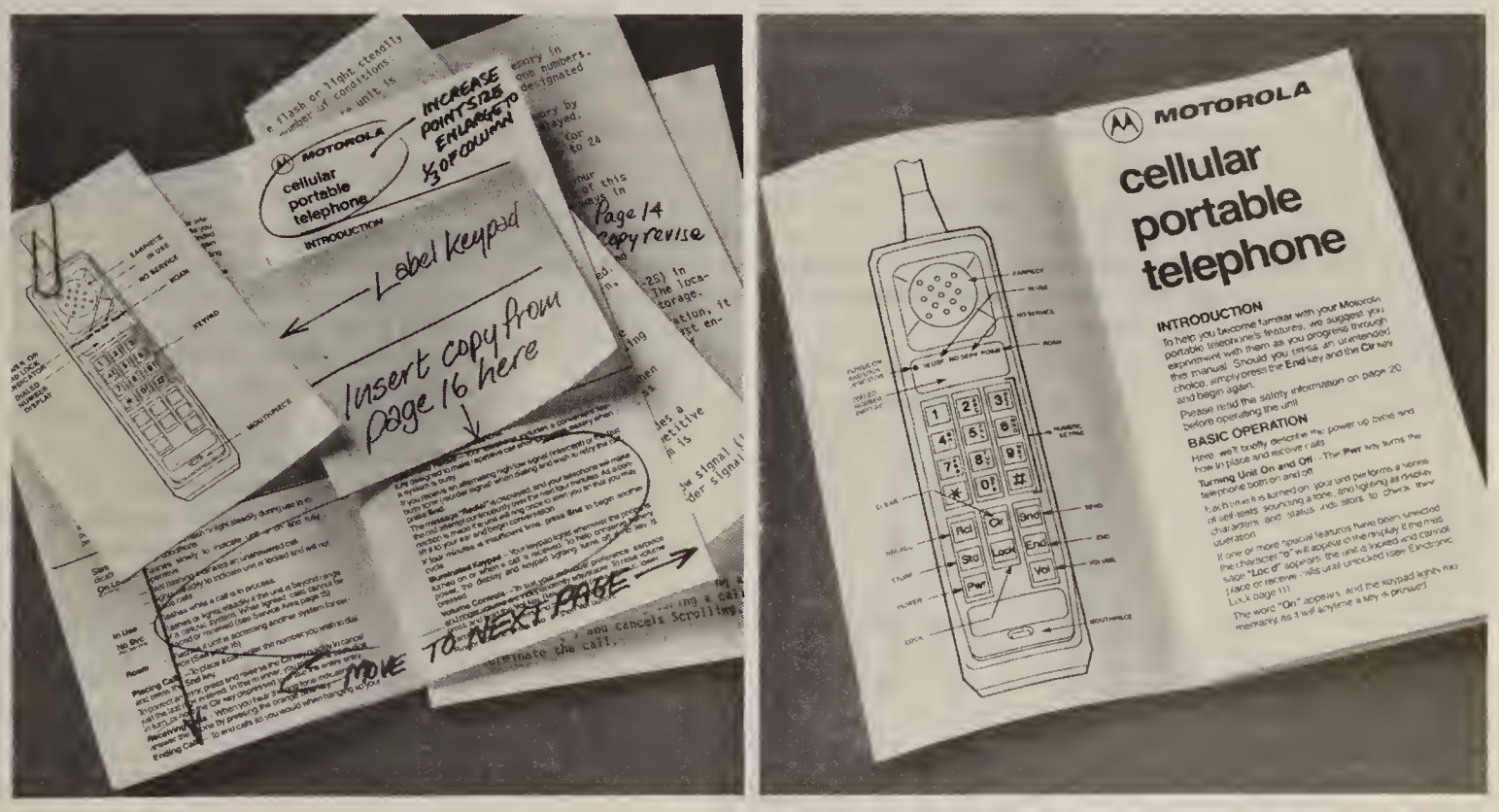
Other points made by Gartner Group analysts at the press conference included the following:

- A well-mapped strategy for connecting with hosts and other workstations will keep Apple Computer, Inc. a major desktop player.
- Companies with a high reliance on information as a competitive weapon will probably be best off going directly from DOS to OS/2 and skipping the Microsoft Corp. Windows stage entirely. Adopting Windows will only delay the systems integration and other benefits companies can get from OS/2 and will require supporting Windows virtually "forever," according to Jonathan Yarmis, a vice president at Gartner Group.

Other companies that are less technology-driven might want to go to Windows for a transition period before adopting OS/2, Yarmis added.

- Local-area networks will continue to be installed at a high rate, with Novell, Inc. and Banyan Systems, Inc. as the market leaders. Although LAN hardware standards will remain relatively stable, software standards in this arena are just beginning to develop.
- In the area of wide-area communications, companies will continue the trend of relying more on the public networks and less on the private ones. An especially important emerging standard in this area is frame relay, which allows voice, data and other forms of information to share the network.

XEROX



Motorola wrote the book on cellular phones. A Xerox system lets them rewrite it in minutes.

Motorola is the world's largest producer of cellular phones. Not to mention cellular phone manuals. For which they turn to a company called Rich Graphics.

But when Motorola decided they wanted to be able to revise and reprint their manuals on a "just-in-time" production schedule, Rich Graphics turned to Xerox.

Working with Rich Graphics, Xerox developed a solution that integrated both hardware and software, Xerox products and other suppliers' products. And the resulting phone manual production is something to talk about—to say the least.

The manuals are now printed on Xerox laser printers just minutes after the revisions flash across the screen of a Xerox workstation. Turnaround time is 80% faster. Costs are down 50%. And the documents produced are 99.99966% perfect.

Of course, Motorola isn't the only client that Rich Graphics uses Xerox for. And the resulting improvement in customer satisfaction has helped Rich Graphics *double* their printing business every year since they came to Xerox.

Which just goes to show that a partnership with Xerox can also help a company rewrite its bottom line.

If you have a document processing problem you'd like Xerox to help you solve, call 1-800-TEAM-XRX, Ext. 125A. Or send in the coupon.

Yes, I'd like to learn more about Xerox and how they can help solve document processing problems.

☐ Please send me information.
☐ Please have a sales representative contact me.

National Quality Award 1989 Winner

Send this coupon to: Xerox Corporation, P.O. Box 24, Rochester, NY 14692

NAME Please Print TITLE

COMPANY PHONE

ADDRESS

CITY STATE ZIP 00013-1119

© 1990 XEROX CORPORATION XEROX® is a trademark of XEROX CORPORATION

XEROX
The Document Company

CALS

CONTINUED FROM PAGE 113

lines, telecommunications companies and manufacturing firms. "They've all heard of CALS, and they all understand it," she said. "They all want centralized databases of information that can be selectively combined into different kinds of documents, seen on a screen, printed or sent to someone electronically."

Advanced Technology, Inc. (ATI) was an early beneficiary of CALS, winning a $160 million job to automate the U.S. Navy's storage and retrieval of engineering data and drawings. ATI's parent company, Black & Decker Corp., is evaluating the scanning, optical storage and retrieval technology developed by ATI for possible use in its power tools manufacturing operation, which it claims is the largest in the world. "Black & Decker wants to see what we're doing for the government, then see how that can be commercialized for the private sector," ATI executive Paul Lombardi said.

Lombardi said that ATI plans to leverage its CALS know-how into other markets — public utilities and health care, for example — which, in total, are expected to be larger than the defense market.

The U.S. government is about to give CALS its own official push into the commercial world. At CALS Expo '90, to be held next month in Dallas, the U.S. Department of Commerce will announce a DOD/Commerce/industry partnership intended to boost the competitiveness of U.S. business by encouraging the widespread adoption of CALS-based technologies and standards. In particular, the partnership will promote the development and adoption of the Product Data Exchange Specification — a way to completely define a product electronically.

CALS Phase I is intended to replace paper flow with digital document and file exchange between vendors and the DOD and within those organizations. The goal is to create data once and paper not at all.

In Phase II, just getting under way and not yet well defined, integration is to take a giant step forward, with the bridged islands of automation replaced by distributed databases accessible by the DOD, contractors and subcontractors via networks linked by intelligent gateways. Instead of transferring files, the files are to be accessed in place by any number of different organizations using different hardware and software. The defense community refers to an "integrated weapon system database" — which would actually be hundreds or thousands of logically linked databases — while in commercial environments, the database would contain any kind of product information.

Phase II has also come to be associated with the concept of concurrent engineering (CE), by which the normally serial phases of design, prototyping and manufacturing are tightly integrated and overlapped. In fact, the overall program is now often referred to as CALS/CE.

While Phase I is mostly an exercise in software, Phase II raises tough issues for hardware vendors, said John F. Leahy, strategic marketing manager for Sun Microsystems Federal, Inc. The controversial concept of sharing databases of the most sensitive information could require much work to improve security, including extensive work to build multilevel secure operating systems, he said. Phase II may also spur development work in Tempest-protected hardware, secure networking and secure databases, he said. "No one can tell you the impact," he said. "Phase II is still a big question mark."

But for vendors with huge investments in proprietary systems, it is not a trivial question. "Does it mean I'll lose out if I can't afford to upgrade to standards?" Bottoms asked. "Yes, that will happen."

THE U.S. Department of Commerce will announce a DOD/Commerce/industry partnership intended to boost the competitiveness of U.S. business by encouraging the adoption of CALS.

Partners in CALS

While CALS is said to bridge islands of automation, it is also bridging some islands in the computer industry. The multidisciplinary nature of design and manufacturing, and hence of the computer tools needed to support it, makes the CALS arena a natural for intra-industry partnerships.

In 1988, Hewlett-Packard Co. established the HP CALS Solution Group: 16 software vendors, including Interleaf, Inc., Mentor Graphics Corp. and McDonnell Douglas Systems Integration Co., all with off-the-shelf CALS-compliant products for HP and HP's Apollo division workstations.

In July, Wang Laboratories, Inc. announced its CALS/CE strategy for providing Wang-based tools for converting text, graphics and document images into CALS-compliant data streams and for creating native-mode CALS/CE information. Wang teamed up with Avalanche Development Co., Softquad, Inc. and Rosetta Technologies, Inc. to develop these capabilities, which will be the cornerstone for a planned major push into the CALS marketplace.

PDES, Inc., a consortium consisting of IBM, HP, Digital Equipment Corp., the Computervision unit of Prime Computer, Inc. and several aerospace and defense contractors, works closely with the government to accelerate the development and implementation of product data exchange standards needed in CALS Phase II.

Of PDES, DOD CALS Director Michael F. McGrath said, "A few forward-looking companies are playing an active role in the development of PDES. These vendors will be one step ahead in getting their products out."

GARY H. ANTHES

Getting down to basics

BY GARY H. ANTHES
CW STAFF

CALS is alternatively described as a methodology, a philosophy and a discipline. While it is all of these, at its most basic, it is a set of standards. The DOD tries to pick standards that will be winners in the marketplace, not just on the battlefield.

In some cases, CALS adopts an existing standard, thereby giving it a stamp of approval that accelerates its marketplace acceptance.

But in other cases, CALS leads the market and the standards-setting community by officially blessing one of several proposed standards or by sponsoring the establishment of new ones.

For example, the DOD is now evaluating proposed optical disc standards and recently sponsored the establishment of an industry group to develop a standard for creating and reassembling subunits of raster images.

Key CALS standards adopted so far include the following:

- Standard Generalized Markup Language, which is a standard for device-independent exchange of data prior to document composition. The language uses markup tags to explicitly define every element of a document.
- Initial Graphics Exchange Specification, which describes vector graphics used in engineering drawings and technical illustrations in computer-aided design systems.
- Computer Graphics Metafile, which is another description of vector graphics.
- CCITT Group 4 for facsimile, which describes compressed bit-map, or raster, graphics.

"CALS says what the standards should be, so we don't have to decide," said Janis Kerrick, CALS program manager at Hewlett-Packard Co. "We in industry and government could have met on this for years, but CALS makes it happen faster."

The DOD works with the National Institute of Standards and Technology (NIST) to get the standards it needs. According to David Bettwy, an official at NIST, some 30 to 40 standards have been picked by CALS so far.

"But eventually there will be a huge number. Ultimately, virtually everything in the information automation world will be covered," he said.

GARY H. ANTHES

© 1989 NEC Home Electronics (USA) Inc

It'll put you in a super mode.

Looking for something a little more uplifting in a monitor? Try NEC's MultiSync® 2A.

Not only is it compatible with regular VGA modes, but it has the ability to put you instantly into a super one. And since SuperVGA gives you 56% higher resolution, that's not a bad place to be.

The MultiSync 2A.

Proof that improving your mode can be as easy as changing the way you look at things.

NEC

DATAPreference MicroAge

Formerly Leasametric Data Communications, Inc.

Northwest: 800.343.7368, 415.574.5797 • Southwest: 800.638.7854, 818.708.2669
Central: 800.323.4823, 708.790.2050 • Northeast: 800.241.5841
Southeast: 800.241.5841, 404.925.7980 • London: 011.44.923.897000
© 1990 Data Preference Incorporated

Women losing ground in IS

Several studies show dwindling number of females heading into IS

BY J. A. SAVAGE
CW STAFF

Although more women are working in the computer industry now than in the past, that trend could be short-lived, according to a collection of studies published by the Association of Computing Machinery this month.

Statistics indicated a fall-off of female interest in the computer industry overall, and a decline in the number of women who are positioning themselves as crucially needed role models by pursuing academic careers in computer science.

In addition, the studies included evidence that indicated gender bias at every educational level could be quietly directing females away from the computer industry.

The number of bachelor's degrees awarded to women in computer science peaked in 1986, and the number of master's degrees peaked in 1987, according to statistics compiled by Betty Vetter, executive director of the Washington, D.C.-based Commission of Professionals in Science and Technology.

Last year showed the highest number of women with computer-related Ph.D.s since 1980, but that number was still minuscule — a total of 72 in the U.S.

Lack of role models

Henry Etkowitz, associate professor of sociology at the State University of New York at Purchase, studied women within academic institutions in such fields as computer science, electrical engineering, chemistry and physics. In general, he said, he found that the lack of women as academic role models propagates an absence of women in academia.

Additionally, at least one researcher found discrimination to be affecting women's ability to advance along the paths that traditionally lead to computer industry careers.

Lesley Klein, instructor of information systems at Pace University in Pleasantville, N.Y., reported that in grade schools and high schools, computer education is spotty at best, with few resources available.

In addition, Klein said, "The computers are always consumed by the boys, who rush in" and dominate them. Girls "practically need interference from the heavens to gain access."

If computers are indeed more alluring to boys than to girls, why is that so? Researchers who sought an answer found a gender bias in software, which they attributed to software engineers who are predominantly male.

Women who get past all the hurdles in academia usually opt out of a career in the ivory tower and choose a career in industry, according to the Association of Computing Machinery's studies. One reason, according to Etkowitz, is the desire for a family: The so-called mommy track made available by many businesses affords flexibility that the tenure track does not.

Once in industry, the corporate culture of short-term profits keeps women from advancing, said Shari Lawrence Pfleeger, who holds the chair of the Status of Women and Minorities at the Association of Computing Machinery.

"Corporations looking from year to year or quarter to quarter won't invest in training for the long term," she said.

Organizations in need of an employee with a particular skill profile, according to Pfleeger, will simply find a person who already fits into the job description — nearly always a man — rather than spend the money it would take to train a woman for the particular job.

Women in computing

The generally increasing number of women employed in computing may be a temporary phenomenon

	Computer systems analysts	Operations and systems	Mathematical and computer scientists (total)
1990			
Total	56,000	239,000	805,000
% women	24%	41.1%	35.7%
1982			
Total	242,000	246,000	488,000
% women	26.4%	31.7%	29%

Source: U.S. Bureau of Labor Statistics — CW Chart: Paul Mock

Bringing women back to IS

What can educators and employers do to make sure that women arrive — and thrive — in the computer industry? The Association of Computing Machinery urges the following:

- Ensure equal access to computers for young girls and boys and develop educational software that is appealing to both.
- Establish programs to encourage high school girls to continue with math and science, for example, science fairs and scouting programs.
- Develop programs to pair undergraduate women with women graduate students or faculty members who will serve as role models.
- Provide women with opportunities for successful professional experiences such as involvement in research projects, beginning as early as the undergraduate years.
- Establish more re-entry programs that enable women who have stopped their scientific training prematurely to retrain as computer scientists.
- Increase awareness of, and sensitivity to, the use of a variety of communications styles, especially those that are less aggressive.
- Develop effective grievance policies to deal with overt discrimination and sexual harassment. Implement studies of existing policies to determine what makes policies effective.
- Expand parental leave policies to allow both fathers and mothers to participate actively in the rearing of small children.
- Maintain lists of qualified female computer scientists to increase the participation of women in influential positions such as program committees, editorial boards or policy boards.

J.A. SAVAGE

INTERNATIONAL BRIEFS

Equal technology

IBM Germany GmbH and Germany's **Robotron Ascota AG** are joining forces to speed the creation of a technologically modern information infrastructure in the former East Germany. A joint venture firm called **Computer-SystemdiensteGmbH,** held 51% by Ascota and 49% by IBM Germany, will offer software and services aimed at enabling access to a broad range of both computers and international standards. Details of the new firm's capitalization were not disclosed.

Lovely Rita maid

Gas consumers in Scotland now have **Victor U.K.** to thank for their bills. For an approximate half-million dollars, **British Gas Scotland** is gearing up with some 80 of the British computer vendor's handheld models. The deal, struck last month, will put pay to the old method of whiting out gas meter readings on paper: In the future, each meter's figure will be keyed into a handheld Victor M1000 and downloaded via modem to British Gas' ICL, Inc. mainframe in Edinburgh.

Eye on a prize

British electronics player **Racal Electronics PLC** last week did an end run around looming outside acquirer-hopefuls when it spun off its telecommunications and securities divisions and transferred the remainder of the company in a management buyout. The spun off units were aggregately valued at some $6 billion. Racal's move, however, may have merely shifted the center of acquisitive action: Analysts reportedly are already eyeing the lucrative **Racal Telecom** as an attractive acquisition candidate in its own right.

Further East

Stratus Computer, Inc.'s Asia-Pacific operations have grown from $2 million to $50 million since the firm opened in Hong Kong four years ago. Small wonder, therefore, that the Marlboro, Mass.-based online transaction processing systems vendor last week expanded its Far East territory with a Singapore-based sales subsidiary and distributorship agreements covering Thailand, Indonesia and the Philippines.

Parlez-vous francais?

Where does a Japanese powerhouse plant its first European flag? **France, Hitachi Ltd.** said early this month, as it announced plans to open a disk drive plant near Orleans by April 1992.

NATIONAL BRIEFS

Goodfellas

Hewlett-Packard Co. early this month enacted a new slate of benefits likely to ensure the Palo Alto, Calif.-based computer vendor continued tenure on the slew of "Best Companies To Work For" lists on which it has become a fixture. Beginning Jan. 1, HP's 57,000 U.S.-based employees will enjoy a dependent-care resource and referral service, a four-month parental leave benefit — twice the current two-month provision — and $2,500 toward defraying the costs of adopting a child.

Prime interest rate

The firm that industry observers once feared would buckle under the staggering debt load it acquired in last year's leveraged buyout last week made another in a series of early payments on its outstanding debt. **Prime Computer, Inc.** forwarded $25 million to its senior bank lenders that was not due until Dec. 31. According to Prime Chief Executive Officer James McDonald, the company — still in comeback mode and aiming at front-rank computer-aided design and manufacturing and computer systems market status — will save some $450,000 in interest payments by getting the money in early. So far, McDonald said, Prime has reduced its debt by $145 million; the firm reportedly has approximately $1 billion left to go.

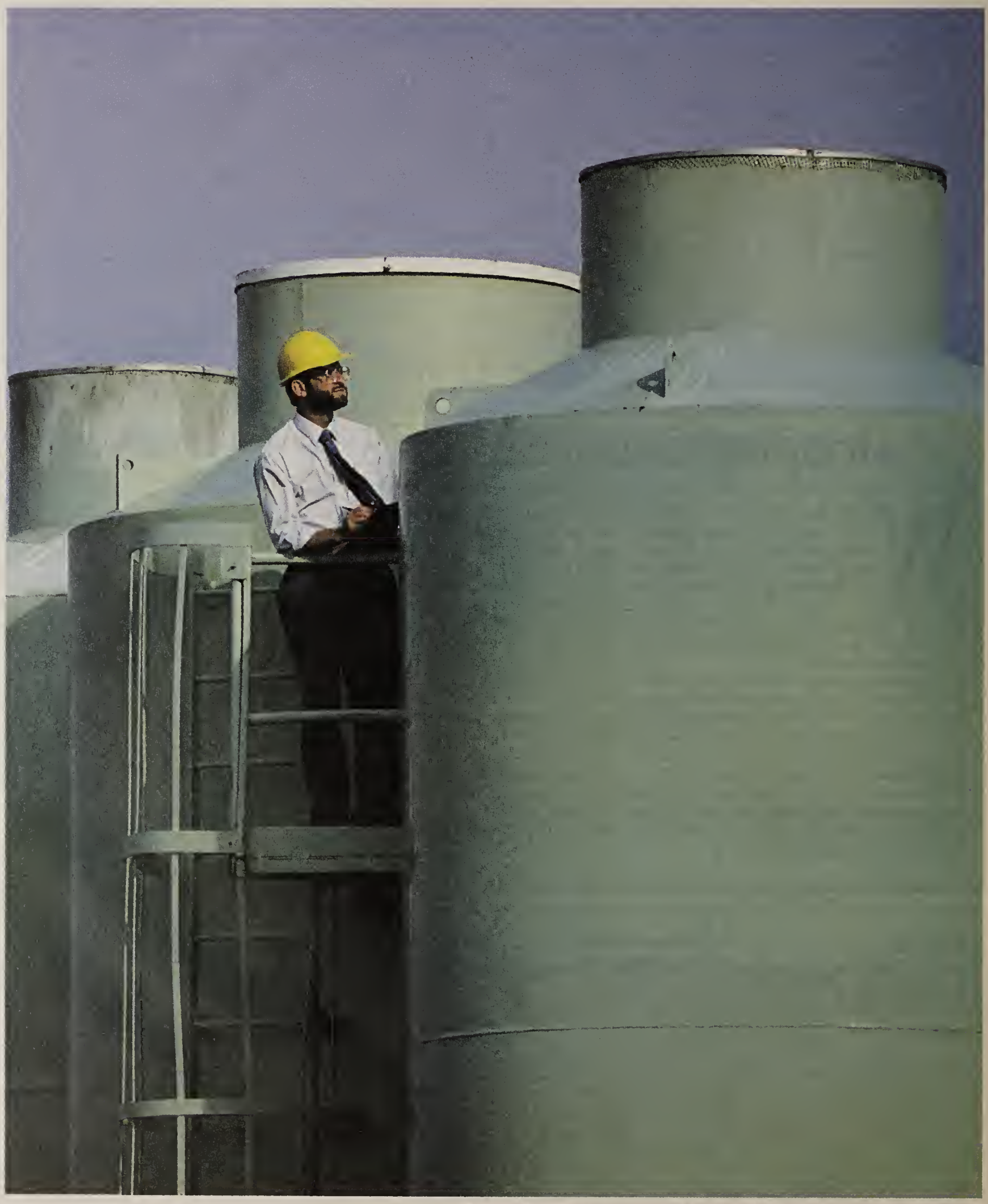
Mapping a strategy

IBM is already all over the map. Now the company will help its customers get there, too, with the aid of business ally **Utility Graphics Consultants.** One year ago, IBM made an equity investment in the Englewood, Colo.-based geographic information systems (GIS) consulting firm. This month, IBM reinvested — again, in an unspecified amount — and the firms tightened their ties, as well as their resolve to help IBM customers set up and support IS with integrated GIS elements.

Ultimate savings

The Ultimate Corp. last week quantified the savings it expects to reap from the massive corporate restructuring and layoffs announced earlier this month [CW, Nov. 12]. The cost-cutting, Chief Executive Officer Michael O'Donnell said, should put an annual $20 million back in the company coffers — and restore black ink to the balance sheet.

NetWare Solves
Issues At



©1990 Novell Inc. Macintosh, OS/2, Lotus, dBase and WordPerfect are trademarks of their respective holders.

Environmental The EPA.

There are many environmental concerns at the EPA. But thanks to NetWare,® dissimilar computing environments are no longer an issue.

That's because the EPA chose NetWare to connect a wide range of computers into its 5,000 node, wide-area network. "NetWare lets us integrate DOS, Macintosh, OS/2 and mainframe environments," says Steve Stoneman, manager of LAN systems support.

But open connectivity is only one consideration. After all, the EPA can't afford to test the waters with an unreliable network. So they use the only PC-based network operating system that's in its eighth generation. According to Stoneman, "We use NetWare for its reliability, advanced capabilities and functionality. It's easy to maintain, and we are very pleased with the security that NetWare provides."

In addition to sharing information and accessing several host systems, the EPA tracks cleanup efforts and communicates through E-mail over its NetWare network. All of which make for a very productive office environment. In fact, Stoneman attributes some significant cost savings to NetWare, "We no longer need a laser printer on every desk or 12,000 copies of dBase, Lotus and WordPerfect."

Fact is, NetWare is compatible with more applications and hardware than any other network operating system. Which makes software incompatibility and equipment obsolescence things of the past.

So call 1-800-LANKIND for your NetWare Buyer's Guide. And learn why the agency in charge of protecting our environment chose NetWare for theirs.

The Past, Present, and Future of Network Computing.

Beware: Accounting rules may change

BY JEAN S. BOZMAN
CW STAFF

Do your eyes glaze over when you see the word "accounting?" If you work for a software firm, don't let it happen this time. Software firms that are already facing the prospect of an economic downturn may find 1991 doubly trying if proposed revisions to accounting procedures for revenue recognition are approved.

The rules, which are slated to be circulated by the American Institute of Certified Public Accountants (AICPA) early next year, would provide a common set of accounting rules for software firms that could specify how companies report receivables from new sales and perhaps slash at those firms' earnings reports for at least one year.

Under the current rules, practices for software accounting vary widely in the industry, software executives said. Some contracts allow firms to recognize revenue from a long-term contract all at once, while others account for revenue as products are shipped throughout the year. The new rules appear to favor revenue recognition as products are shipped, according to industry sources.

"These rules will push a lot of revenue out over [a company's financial] quarters for the first year the AICPA rules go into effect," said Jeff Papows, president of Cognos Corp. in Burlington, Mass. The rules, he said, could have a strong impact on many companies. However, he added, it should be a onetime impact, with an immediate benefit for users who track the corporate health of their suppliers.

"If everyone implements the rules at the same time, you'll be able to make apples-to-apples comparisons between software companies, perhaps for the very first time," Papows said.

Barring major complaints, the rules will pass into "generally accepted accounting practice" by late 1991. That means they will become the law of the land and be enforced by the Securities and Exchange Commission (SEC). Furthermore, the accounting firms that audit software companies will have to abide by them, because the AICPA wrote the rules and the Financial Accounting Standards Board (FASB) approved them.

Separate findings

"The SEC is strongly encouraging everyone to get this document out the door," said Paul Wilde, chief financial officer of Viasoft, Inc., who chairs Adapso's Software Business Practices Committee. In the absence of official standards, the SEC has had to make separate findings for each instance of questionable accounting. In fact, the FASB reviewed a final draft last week.

The new rules will affect every firm that gains revenue from software licenses or software maintenance contracts. "Up to now, there just hasn't been a single set of accounting standards in the software industry," Wilde said. "New firms would study the way that major software firms accounted for their revenues, and there were several ways to do that. Now there will be a written set of rules, rather than historical precedent, to go by."

Publicly held firms will have to comply with the new accounting rules as soon as they go into effect. Privately held firms do not need to comply right away but may be told by their auditors or financial backers to comply, Wilde said. Accordingly, CFOs across the country have been giving the AICPA draft document a close second look. "Some companies hoped to hell it wouldn't happen," said Jeanne Wohlers, CFO of Sybase, Inc. The most controversial issue in the AICPA proposal appears to be the way in which software maintenance fees are recognized. The new rules would spread out all maintenance renewal fees over 12 months and would "break out" the first year's maintenance fee — often included in the original license fee — for similar treatment.

If trouble hits, only we guarantee to get your 800 calls through in 30 minutes.

The new AT&T 800 Assurance Policy. Faster than ever.

You never know when it may happen, but if an accident knocks out your 800 service, you're out of business.

That's why we automatically protect our 800 customers with the AT&T 800 Assurance Policy.* And now, why we're making our Assurance Policy faster and better than ever.

While we used to ensure that you were back in touch within 60 minutes, now we guarantee results in a mere 30 minutes or less. If you have a problem, for example, with your telephone equipment or your local telephone company, call AT&T. And we will reroute your 800 calls to any working phone at any location, or provide a customized message, all within minutes. So with AT&T, even if the unexpected hits, your business won't crumble.

800 calls that get through. Another AT&T advantage.

*We've just made choosing the most reliable 800 service more affordable than ever. Now through December 31, get free installation on any new domestic AT&T 800 Service.***

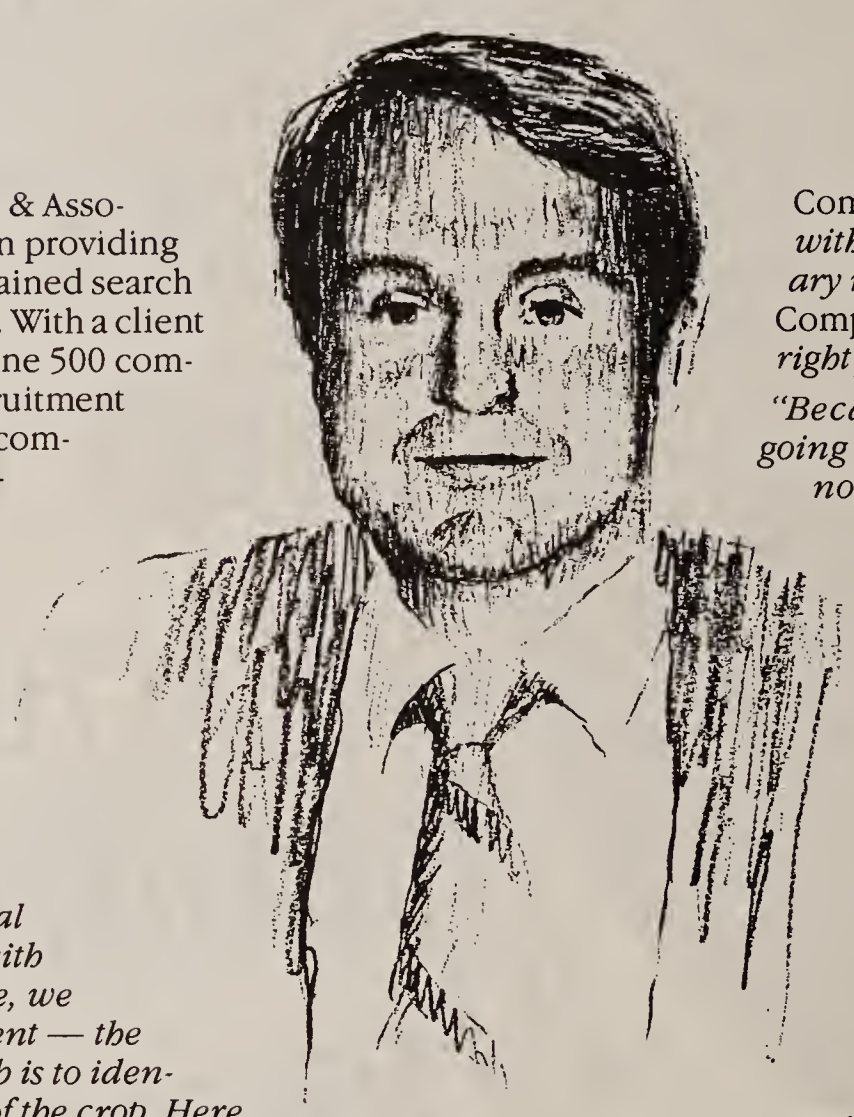
For full details, call your AT&T Account Executive or 1 800 222-0400.

© 1990 AT&T
*Applies to all domestic, interstate AT&T 800 services.
**Offer pending FCC approval. Except intrastate basic 800 Service.

AT&T
The right choice.

"Computerworld is a primary source to find the right pool of top technical talent."

Bill Young
President
Bill Young & Associates



For over a decade, Bill Young & Associates of Fairfax, VA, has been providing cost-effective contingency and retained search services to companies nationwide. With a client base of small, mid-sized and Fortune 500 companies, the firm specializes in recruitment for data processing, engineering, communications, consulting, manufacturing, financial services and defense. On-site consulting and complete administrative/office support placement are offered by other company divisions as well. As explained by President Bill Young, they have a product to sell — and that product is people.

"I consider myself to be a technical talent scout. Every year we talk with over 30,000 professionals. Of those, we actively work with about 10 percent — the 3000 or so top candidates. Our job is to identify the best qualified, the cream of the crop. Here, Computerworld *serves as a valuable tool in helping us find top talent for new openings — and new openings for available talent.*

"The initial and most immediate goal of our recruitment advertising is to fill requisitions for existing positions. Computerworld *is a primary source to find the right pool of top technical talent. And, with* Computerworld, *we also get a secondary residual value that's difficult to measure. As a direct result of our recruitment advertising in* Computerworld, *we've gotten specific retainers with new client companies — plus secondary referrals up to 12 and 18 months later.* Computerworld *definitely gets us talking to the right people.*

"Because Computerworld *is the pulse of what's going on in the industry, the right people take notice. So when our recruitment advertising appears in* Computerworld, *we know we're telling the right people about our full-service package that encompasses everything from initial screening and resume preparation to travel arrangements, relocation issues, salary negotiations — even personnel practices and outplacement.*

"Looking ahead, we hope to expand our search service into the global marketplace. When the time is right, we'll be counting on Computerworld *to help Bill Young & Associates target international recruitment prospects as well. As long as we're in the business,* Computerworld *will always hold a prominent position on our recruitment advertising schedule."*

Computerworld. We're helping serious employers and qualified information systems, communications and PC professionals get together in the computer community. Every week. Just ask Bill Young. For all the facts on how *Computerworld* can put you in touch with qualified personnel, call your local *Computerworld* Recruitment Advertising Sales Representative today.

COMPUTERWORLD

The weekly newspaper of record for computer professionals.

Boston: 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700
New York: Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090
Washington D.C.: 8304 Professional Hill Drive, Fairfax, VA 22031 (703) 573-4115
Chicago: 10400 West Higgins Road, Suite 300, Rosemont, IL 60018 (312) 827-4433
Los Angeles: 18008 Sky Park Circle, Suite 145, Irvine, CA 92714 (714) 250-0164
San Francisco: 18008 Sky Park Circle, Suite 145, Irvine, CA 92714 (714) 250-0164

An IDG Communications Newspaper

Teach yourself to be a good manager

BY JANET RUHL
SPECIAL TO CW

We've all heard about the problems technical people face when making the transition to information systems management: weak communication skills, a tendency to become overwhelmed with details and difficulty delegating responsibility. Fortunately, would-be managers can overcome these stumbling blocks with a little self-education.

One of the best places for them to start is at the library. Wilford Miles, professor of management at the Barney School of Business and Public Administration at the University of Hartford in Connecticut, suggests that management hopefuls read some of the time-tested business classics.

For an overview of what management is all about, Miles recommends two Peter Drucker books: *Managing for Results* (Harper & Row Publishers, Inc., originally published in 1964 and reprinted in 1986), and *The Effective Executive* (Harper & Row, 1986).

Miles' recommendation is echoed by Wayne Cannon, a technical support manager at Hewlett-Packard Co., who made the transition from engineer to manager six years ago. Cannon describes *The Effective Executive* as "an inspirational book for the new manager that helps to draw the line between what is truly important and the hundreds of other issues that vie for a manager's time."

To understand what is driving other managers, Miles encourages new managers to learn something about strategic planning and high-level decision-making. To get started in this direction, he recommends reading *The New Corporate Strategy* by H. Igor Ansoff (John Wiley & Sons, Inc., 1988 — a revision of his earlier classic *Corporate Strategy*, now out of print) and *Developing Business Strategies* by David Aaker (John Wiley, 1988, second edition).

For an understanding of some of the specific management techniques used by IS project managers, Cannon recommends reading *Peopleware: Productive Projects and Teams* by Tom DeMarco and Timothy Lister (Dorset House Publishing Co., 1987).

Cannon says he also benefited from reading both Frank O. Milo's *How to Get Your Point Across in 30 Seconds — or Less* (Simon and Schuster, Inc., 1986) and Stephanie Wilson's *The Organized Executive* (Warner Books, 1985). The latter, he says, "helps reduce the time spent on administrivia and busywork and provides ideas for being more efficient in the vital tasks."

While books are a great place to begin, management hopefuls should supplement their education with some interactive learning activities, such as seminars and workshops tailored to the needs of new managers.

Roger Loeb, who began his career as a programmer and later spent seven years as vice president of MIS at a large Colorado corporation, recommends taking "Effective Speaking and Human Relations," a course offered by Dale Carnegie Training.

Loeb confesses that he was skeptical at first about the Carnegie course, thinking that it would be a waste of time for him. But after being forced to attend by his employer, Loeb became an enthusiastic proponent of the course, which he says taught him to communicate in a much more focused way.

> WHILE BOOKS ARE a great place to begin, supplement your education with seminars and workshops tailored to the needs of new managers.

Barry Schrager, president of SKK, Inc. and manager of 160 employees, found the seminars given by the American Management Association useful in helping his technical people make the transition to management. He says the company spent a considerable amount of money on seminars to help its policy of promoting from within succeed.

Project management workshops

For seminars that address the specific needs of IS managers, such as managing personnel and hardware and software projects, IS management consultant Carl Brown recommends IBM's "Project Management Workshop" and "Project Management for Executives."

Managers or potential managers who prefer to take a more structured approach in learning about management — such as college courses — may be surprised to learn how the past decade's technological explosion has revolutionized the delivery of off-campus college courses.

Emerging satellite technologies and technology-delivered instruction enable more college attendance than ever before. Even those who live far from a major university can participate in formal academic MBA programs.

One organization that promotes the use of high-tech in delivering instruction is National Technological University (NTU), which is based in Fort Collins, Colo. NTU is a nonprofit cooperative venture of 29 leading universities including Rensselaer Polytechnic Institute, Boston University, Purdue University and the University of Notre Dame, as well as a host of major state universities and institutes of technology.

NTU works in association with employers to offer credit and noncredit graduate-level courses to employees at their work sites. These courses originate at member campuses and are taught by university faculty. They are transmitted to the employer sites over satellite hookups.

Currently, NTU offers course work in engineering management and management of technology. Short, noncredit management courses are also available. NTU reports that in the 1989-90 school year, 3,600 people were enrolled in its graduate courses at 302 work sites in North America.

Ruhl is a consultant and programmer in Connecticut and author of *The Programmer's Survival Guide: Career Strategies for Computer Professionals.*

INFORMATION SYSTEMS PROFESSIONALS

CONSIDERING RELOCATING?
UNFAMILIAR WITH THE AREA?

PTS can help you make connections with some of the best search and recruiting firms throughout the U.S. which specialize in placing information systems professionals. We also alert you to some of the major companies in the geographic area of your choice which match your qualifications and skill sets. Through our **NATIONAL NETWORK**, we will put you in front of the people who can help you make the ***Right Move!***

TECHNICAL THROUGH MANAGEMENT

CALL: (800) 755-1038

PTC
PARALLEL TECHNOLOGY SOLUTIONS, Inc.
11818 S.E. Mill Plain Blvd.
Suite #307
Vancouver, WA 98684
PARALLEL TECHNOLOGY SOLUTIONS, INC

RSVP SERVICES

ANALYSTS • PROGRAMMERS • HW/SW

In a Slow Market, You Need A Quick Employment Service

If you have marketable skills, together with reasonable geographic and salary requirements, your resume will be on its way selectively, to our applicable contacts among our 1000+ client companies and 200+ affiliates nationwide, ***within 24 hours after we receive it.*** No cost or obligation to you; no sales pressure

Our clients seek 2 years minimum professional experience, stable work history, good technical references, and U.S. citizenship or green card

TO APPLY: Mail or FAX resume or call Howard Levin.

RSVP SERVICES
Dept. C, Suite 614, One Cherry Hill Mall, Cherry Hill, NJ 08002
800-222-0153 or FAX: 609-667-2606 (refer to Dept. C)

WANTED: WARRIORS

If you consider a business suit your battle dress and technology as heavy artillery, you may be perfect for Broadway & Seymour Consulting.

We're a small but very aggressive systems consulting and software development firm. In fact, we're so aggressive *Business Week* rated us as one of the fastest growing high-tech companies in America.

So, if you'd like to join an elite team engaged in the art of technological warfare, call Camille Hankins at 1-800-274-9287 or send your resume to: 302 S. Tryon St., Charlotte, North Carolina 28202.

BROADWAY & SEYMOUR CONSULTING

We're looking for warriors.

Positions:
- Managing Consultants
- Software Engineers
- Consultants
- Technical Instructors
- Technical Writers

Expertise:
- Relational Technology & 4GL
- Midrange Systems
- SW Engineering & Case Tools
- Telecommunications & Distributed Environments

Programmers/ Project Managers

Implement and customize Dun & Bradstreet software packages for Fortune 1000 clients. Excellent salary & benefits including 401(k) plan. Travel required but no relocation involved. Must have IBM utilites, JCL, Cobol and 2 or more years' experience with financial software packages (Dun & Bradstreet preferred). Please send your resume in COMPLETE CONFIDENCE to: **PARKS & ASSOCIATES, 35526 Grand River, Suite 242, Farmington Hills, MI 48335 or call 1-800-899-1448. All fees employer-paid.**

PARKS & ASSOCIATES
Recruitment Services

Computer Technology

Purdue University School of Engineering and Technology at Indianapolis (IUPUI) invites applications for a tenure-track position in the Department of Computer Technology, available August 1991. Candidates must have a minimum of a master's degree. Ph.D. preferred. Applicants must have background in data communications software and hardware (LAN experience preferred). Business or industrial experience and teaching experience are required. The successful applicant will teach undergraduate courses in data communications and related data processing areas, as well as demonstrate continuing professional development, creativity, and excellent communication skills. Rank and salary dependent on qualifications.

Please send resume and the names and addresses of three references by January 31, 1991 to:

Professor Robert G. Crozier, Chairman, Department of Computer Technology, IUPUI, 1201 E. 38th Street, Indianapolis, IN 46205-2868

IUPUI is an Equal Opportunity/Affirmative Action employer.

FREE! 1990 COMPUTER INDUSTRY SALARY SURVEY

Immediately available from National Computer Associates... in-depth data on 1990 compensation levels... gathered from thousands of EDP employers from all across the nation. The salary ranges are comprehensive, listing: median-low, region-median and median-high incomes covering all job titles generally used.

To compare your own earnings with those of others, get a copy of this up-to-the-minute Salary Survey. The survey covers, not only your own region, but all other regions in the U.S.A. ...in case you want to relocate.

This Salary Survey is provided free-of-charge as a service to the computer profession by the nation's leading network of independent placement specialists... National Computer Associates.

Simply contact the NCA firm nearest to you.

National Computer Associates

ATLANTA: DataPro Personnel Consultants
1050 Crown Pointe Pkwy Suite 430
Atlanta GA 30338 (404) 392-9990
BOSTON: Robert Kleven & Co., Inc
PO Box 636
Lexington, MA 02173 (617) 861-1020
CHICAGO: Thomas Hirtz & Associates
150 North Wacker Drive Suite 1700
Chicago IL 60606 (312) 977-1555
CINCINNATI: Task Group
7875 Reading Road
Cincinnati, OH 45237 (513) 821-8275
CLEVELAND: Innovative Resources Corporation
Beachcliff Executive Centre
1340 Depot Street, Suite 210
Rocky River OH 44116 (216) 331-1757
COLUMBUS: Michael Thomas Inc
450 W Wilson Bridge Road Suite 340
Worthington, OH 43085 (614) 846-0926
DALLAS: DataPro Personnel Consultants, Inc
13355 Noel Road Suite 2001
Dallas TX 75240 (214) 661-8600
DENVER: Abacus Consultants, Inc
1777 South Harrison Street, Suite 404
Denver, CO 80210 (303) 759-5064
DETROIT: Electronic Systems Personnel
3000 Town Center, Suite 2580
Southfield, MI 48075 (313) 353-5580
GREENSBORO: DataMasters
PO Box 14548
Greensboro, NC 27415-4548
(919) 373-1461
HOUSTON: Career Consultants, Inc
1980 Post Oak Boulevard Suite 1050
Houston, TX 77056 (713) 626-4100
KANSAS CITY: DP Career Associates
6405 Metcalf, Suite 502
Shawnee Mission KS 66202 (913) 236-8288
LOS ANGELES: Superior Resources, Inc
22653 Pacific Coast Highway, Suite 1-106
Malibu CA 90265 (818) 884-3000
MEMPHIS: Information Systems Group
4646 Poplar Suite 417
Memphis, TN 38117 (901) 684-1030
MIAMI: Data Sciences Personnel, Inc
P.O. Box 8577
Hollywood FL 33084 (305) 434-6112
MILWAUKEE: EDP Consultants, Inc
Chancellory Park II, Suite 350
350 N. Sunnyslope Road
Brookfield, WI 53005 (414) 797-8855
MNPLS./ST. PAUL: Electronic Systems Personnel
701 Fourth Avenue South Suite 1800
Minneapolis, MN 55415 (612) 338-6714
NEW JERSEY: Systems Search
2040 Millburn Avenue
Maplewood, NJ 07040 (201) 761-4400
NEW YORK: Total Associates Inc
7 Dey Street, Suite 410
New York, NY 10007 (212) 227-7370
PHILADELPHIA: Systems Personnel, Inc
115 West State Street
Media, PA 19063 (215) 565-8880
PHOENIX: Professional Career Consultants
4725 North Scottsdale Road, Suite 209
Scottsdale, AZ 85251 (602) 274-6666
PITTSBURGH: KCS Computer Services, Inc
400 Penn Center Blvd Suite 320
Pittsburgh, PA 15235 (412) 823-8632
ROCHESTER: Traynor Confidential Ltd
10 Gibbs Street, Suite 400
Rochester, NY 14604 (716) 325-6610
SAN DIEGO: Technical Directions Inc
8880 Rio San Diego Dr Suite 1025
San Diego, CA 92108 (619) 297-5611
SAN FRANCISCO: Professionals for Computing Inc
455 Market Street Suite 1850
San Francisco, CA 94111 (415) 957-1400
SEATTLE: Houser, Martin, Morris & Associates
110 110th Avenue N.E., C-90015
Bellevue, WA 98009 (206) 453-2700
STAMFORD: Hipp Waters Professional Recruiting
707 Summer Street
Stamford, CT 06901 (203) 357-8400
ST. LOUIS: Executive Career Consultants
795 Office Parkway Suite 100-CW
St. Louis, MO 63141 (314) 994-3737
SYRACUSE: The CFA Group Inc
5790 Widewaters Parkway
Dewitt, NY 13214 (315) 446-8492
WASHINGTON D.C.: Technical Recruiters
8701 Georgia Avenue, Suite 607
Silver Spring, MD 20910 (301) 495-3111
AUSTRALIA: For information, contact the NCA firm nearest to you
LONDON, England: For information, contact the NCA firm nearest to you

Systems Engineer

Provide computer programming support for a variety of marketing and product planning computer systems. Under general direction develops and maintains data processing applications which meet customer business needs. Codes, tests and implements computer programs in developmental and maintenance modes. Defines system requirements and priorities with customers and ensures that daily needs are met. Develops system and programming specifications. Designs data processing solutions based on business need and technical considerations. Researches and resolves application production problems. Monitors application performance and performs run time improvement functions. Prepares system documentation.

Education Required:
Bachelor of Science – Computer Science.
Experience Required:
Programmer/Analyst - 2 years. Experience must include 1 year working in an IBM MVS environment using PL/1; 2 years designing and coding of PC software; 1 year programming in "C" interfacing with MS/DOS and use of project management tools.

The minimum working hours are 40 hours per week, with a starting salary of $37,800 per year. This ad is employer paid.

Please send resume in confidence to: Michigan Employment Security Commission, 7310 Woodward Avenue, Room 415, Detroit, Michigan 48202.
Reference No. 77490.

An Equal Opportunity Employer M/F/V/H

Hardcore Software People

We need analysts/programmers for IBM or DEC environments. According to Inc. Magazine WTW is #130 of America's fastest growing companies. Join our team and earn what you're worth. WTW is a national software consulting firm offering excellent salary and benefits and the opportunity to position yourself for success.

Call immediately or send resume:
1-800-833-2895
Attn: Nancy Lawless
Wesson, Taylor, Wells
P.O. Box 3046
Valley Forge, PA
19484-3046

WTW SOFTWARE CONSULTING SERVICES

Wesson, Taylor, Wells is an equal opportunity employer

Sunbelt Opportunities

ADABAS/NAT Prog/Anal's	30-37K
TANDEM Prog/Anal's	30-40K
DB2/SQL Prog/Anal's	30-40K
AS/400-S/38 Prog/Anal's	30-37K
Bank Prog/Anal's	30-36K
Insurance Prog/Anal's	30-35K
Manufacturing Prog/Anal's	32-36K
Retail Prog/Anal's	29-34K
MSA or M&D Prog/Anal's	33-40K
CICS Prog/Anal's	30-36K
IMS DB/DC Prog/Anal's	30-36K
ASSEMBLER Prog/Anal's	29-35K
MVS/COBOL Prog/Anal's	25-30K
VAX/COBOL Prog/Anal's	32-36K
HP 3000-COBOL Prog/Anal's	30-35K
DB2 or IMS DBA's	40-49K
EDP Auditors	33-46K

North Carolina's largest employment agency, in business since 1975, 300 affiliates. Opportunities in the Southeast and nationwide

Corporate Personnel Consultants
3705-320 Latrobe Drive, Box 221739
Charlotte, NC 28222 (704) 366-1800
Attn: Rick Young, C.P.C.

Weekly. Regional. National. And it works!

Just four reasons why more companies run more recruitment advertising in *Computerworld* than in any other specialized business newspaper.

For more information or to place your ad regionally or nationally, call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700).

Weekly. Regional. National. And it works.

An IDG Communications Publication

DATA PROCESSING PROFESSIONALS

SCT

VITAL CAREERS... LONG TERM GROWTH

Combine the best features of working in a major academic environment with the excitement and opportunity provided by working for an innovative firm with a 20 year history of success. We're SCT, known throughout the nation for developing and supporting advanced software and systems to clients in higher education and local government. We seek:

- **Technical Directors**
- **Technical Service Managers**
- **Operations Managers**
- **Administrative Systems Managers**
- **System & Applications Programming positions are also available.**

These positions are currently available at our suburban Philadelphia headquarters and at client sites in metropolitan New York, Boston, Los Angeles and other client sites throughout the nation. Send your resume with salary history, or call: Moira Hudson, (800) 441-7247. An Equal Opportunity Employer M/F.

SYSTEMS & COMPUTER TECHNOLOGY CORP.
Great Valley Corp. Center
Dept. CW, 4 Country View Rd.
Malvern, PA 19355.

ROBERT HALF

Specialized Recruitment For The Information Systems Profession

PROVIDING CAREER SOLUTIONS FOR OVER 40 YEARS

Looking for a challenging assignment, a change in environment, or an attractive job offer? Let the Robert Half network of placement specialists assist you in your career search.

If you have the information systems expertise, call the Robert Half office nearest you today for a rewarding career opportunity.

COBOL Programmer Analysts

Learn CICS! New CICS project requires 4 professionals with 2+ years of IBM OS/COBOL and CMS. Will be trained in CICS. Great work environment. To $35K

IBM DB2 Consultants

- Robert Half Exclusive - Big 6 consulting firm is building a DB2 consulting practice. Desire top DB2 professionals with minimum 3 years experience as DB2 DBA or in DB2 systems development. Both management and technical positions available. Travel or relocation required. To $80K

MSA P/A's

Two positions with Fortune 100 company, IBM MVS/XA DB2 environment to work on major Financial and Payroll projects. 2+ years IBM OS/COBOL with MSA systems strongly preferred. INFO EXPERT a real plus. Will train in DB2. To $45K

PC/LAN Specialists

Two Fortune 500 firms are looking for professionals with 2+ years PC/LAN technical hardware & software support experience with either NOVELL, BANYAN or 3COM networks. Opportunity for some travel. To $45K

DEC VAX ORACLE Consultants

Multiple positions for VAX ORACLE programmers through systems designers with 2 or more years of ORACLE experience on ANY hardware. Both Vendor and Corporate positions available. To $55K

IBM S/38 - AS/400 P/A's

Major suburban financial services firm, a growing AS/400 shop, is looking for 2 professionals with 2 more years of RPG III experience. Multiple promotions have opened up two P/A slots on new development project. To $45K

Case Tools Experts

Major commitment by Blue-Chip firm requires CASE TOOLS professional to select and implement CASE technology for the corporation. Must have 5+ years large scale IBM MVS based systems development. Experience with ACCELERATOR, TEAMWORK or other CASE tools required. This expansion has also opened positions for IBM programmer/analysts through systems analysts using CASE. To $65K

HP Powerhouse Systems/Analyst

Step up to Project Leadership. Fast growing subsidiary of Fortune 500 firm. Person will lead development of new Financial Decision Support systems in Powerhouse/Quiz/Quick/QTP on the Hewlett Packard 3000. Also will work with PC's. Requires 3 to 5 yrs of sys dev in Powerhouse or other relational DBMS. To $50K

RPG II Programmers Programmers/ Analysts

Fast track RPG II Programmers and Programmers/Analysts with at least 3 years experience will be trained in RPG III/AS400. Excellent career. To $32-35K

OS COBOL/CICS

Learn DB2/SQL. Dynamic financial services organization seeks a seasoned on-line OS COBOL-CICS Prog/Anal. Will train on DB2/SQL. To $45K

Windows Application Software Developers

Major services firms developing new PC Based front end systems using Microsoft WINDOWS. Requires 2+ years programming experience with MS/Windows or other windowing product. C experience strongly preferred. To $60K

PC Analysts

Learn LAN's. Outstanding opportunity exists for a solid PC Analyst with a minimum of three (3) years CLIPPER and DBASE experience to learn Local Area Networking and work in a state-of-the-art Information Center Environment. To $35K

IDMS

Learn DB2/CASE TOOLS. Data Center expansion dictates the need for add'l individuals with talents in OS COBOL, IDMS and ADSO to join new project teams now forming. Oppty to learn DB2 and/or CASE TOOLS. To $50K

MVS Sys/Prog

Learn Performance Tuning. Sophisticated Tech Support Group of a large Services Organization is seeking a talented MVS Sys/Prog. 3+ years experience performing full SYSGENS is required. Will be trained in MVS Performance Tuning. To $50K

UNIX and C

Outstanding hi-tech software development organization needs several accomplished UNIX and "C" professionals due to unparalleled growth. Three years minimum is required and experience with UNIX KERNEL is a big plus. To $48K

DEC VAX

Major financial services organization seeks a heavyweight DEC VAX Senior Programmer Analyst with at least 5 years experience. The right person will be trained in project management and networking. To $45K

DB2/CASE/DATA MODELING

Nat'l consult firms seek indivs w/3-10 yrs DB2, Case Tools, or Data Modeling. Ex. benefits. full relo. Opptys for SRS/MGRS. Positions in ATL, BALT/WASH, CALIF. Call San Diego for details. $50-120K

Systems Analyst

Progressive "Employee Owned" Carolina firm has multiple oppty's for sharp-minded systems professionals with 2+ years experience in COBOL/CICS and IMS-DL/1. Excellent growth environment with ability to progress into several exciting areas including DB2 and CASE tool development. Line up your future with this success oriented company! To $35K

Management Consulting

Prestigious Southeastern firm has immed. need for systems pros on the FAST TRACK! 1 to 4 years exp. with package software (MSA, M+D, ASI or CA) in a large IBM mainframe environment required. High image, solid academic background and a willingness to travel a must! Career climbing oppty. To $50K

Alabama *Birmingham* (205) 879-4000 **California** *Los Angeles* (213) 386-6805 *San Diego* (619) 291-7990 *San Francisco* (415) 434-1900 *San Jose* (408) 293-9040 *Torrance* (213) 719-1400 **Colorado** *Denver* (303) 629-1010 **Connecticut** *Hartford* (203) 278-7179	**Connecticut** * *Stamford* (203) 324-3399 * *Trumbull* (203) 261-8884 **Florida** *Ft. Lauderdale* (305) 761-3811 *Miami* (305) 447-1757 *Orlando* (407) 422-2275 *W. Palm Beach* (407) 684-8500 *Tampa* (813) 221-7800 **Georgia** * *Atlanta* (404) 392-0540	**Illinois** *Chicago* (312) 616-8200 **Indiana** *Indianapolis* (317) 638-8367 **Iowa** *Des Moines* (515) 244-4414 **Louisiana** * *New Orleans* (504) 835-4296 **Massachusetts** *Boston* (617) 951-4000 **Michigan** *Grand Rapids* (616) 956-9525	**Michigan** *Troy* (313) 524-3100 **Minnesota** *Bloomington* (612) 893-9585 **Missouri** *St. Louis* (314) 727-1535 * *Kansas City* (816) 474-4583 **Nebraska** * *Omaha* (402) 397-8107 **New Jersey** *Paramus* (201) 843-3799 *Iselin* (201) 634-7200	**New York** *Long Island* (516) 333-2121 *New York* (212) 221-6500 * *White Plains* (914) 682-8842 **North Carolina** *Charlotte* (704) 339-0550 *Greensboro* (919) 292-5313 *Raleigh* (919) 787-8226 **Ohio** *Cincinnati* (513) 621-7711 **Oklahoma** *Oklahoma City* (405) 236-0880	**Oklahoma** *Tulsa* (918) 585-1700 **Oregon** *Portland* (503) 222-9778 **Pennsylvania** *Philadelphia* (215) 568-4580 * *Pittsburgh* (412) 471-5946 **Tennessee** *Memphis* (901) 753-7600 *Nashville* (615) 361-4900 **Texas** *Dallas* (214) 363-3300	**Texas** *Houston* (713) 623-4700 *San Antonio* (512) 736-2467 **Washington** *Seattle* (206) 624-9000 **Wisconsin** *Milwaukee* (414) 271-4253 **Canada** *Toronto* (416) 482-1012

* Offices independently owned & operated

© 1990 Robert Half International Inc.

N-3

CA & AZ CONTRACTS

CONSULTANTS WANTED

P. Murphy & Associates, Inc.

4405 RIVERSIDE DRIVE, SUITE 100
BURBANK, CA 91505
(818) 841-2002 (714) 552-0506
FAX: (818) 841-2122

Software Development Engineer: Software development in interactive floorplanning for integrated circuit layout, standard cell and block placement of ICs; develop interactive graphics command for IC editing. M.S. C.S. Req. academic project or research background in large scale software development for IC placement and routing. Also req. advanced academic course work in VLSI design, CAD algorithms, computer design/architectures; PASCAL, FORTRAN; C programming languages; and UNIX. $38,500/yr.; 40 hrs./wk. Place of employment and interview: Beaverton, OR. Must have legal right to work. Clip ad and send with resume to: Job Order #5550070, 875 Union Street, N.E., Salem, OR 97311 not later than December 17, 1990. EEO.

FLORIDA

We are Romac & Associates, specialists in the data processing industry. Currently our technically sophisticated clients have requirements for:

- PROGRAMMER ANALYSTS
- SYSTEMS PROGRAMMERS AND OTHER
- MIS PROFESSIONALS

WHO HAVE EXPERIENCE IN ANY OF THE FOLLOWING AREAS:

• IBM-MVS	• M&D/MSA
• CICS	• SYSTEM 38
• COBOL	• AS-400
• ASSEMBLER	• RPG III
• TANDEM/TAL	• FOCUS
• IMS	• INGRIS
• IDMS	• HP/VAX
• DB2	• C
• CASE TOOLS	

Our clients offer top salaries and a perfect climate. Please send your resume or call any of our consultants.

1 Harbour Place #880C
Tampa, FL 33602
(813) 229-5575

ROMAC

Professional Recruiters

All fees are assumed by our client companies.

PROGRAMMERS/ ANALYST

Consulting Opportunities In South Florida

We need your expertise. If you have two years or more experience in any of the following skills:

- IBM SYS 38/AS400
- J.D. EDWARDS
- DB2
- IMS
- ORACLE
- C
- IMAGING

Please call **ZEITECH, INC.** (305) 938-4461 or fax your resume to: (305) 938-8572.

SOFTWARE OPPORTUNITIES

713/488-7961

Let our national award winning computer specialists assist you in your search. We have over 300 affiliated offices around the country ready to work for you!

SYSTEMS SOFTWARE	$80K+
AS/400, S/38 P/A	TO $48K
LIFE INSURANCE	TO $60K
DB2 ANALYSTS	TO $80K+
IDMS, IMS OR ADABAS	TO $50K
P/A (COBOL OR ALC)	TO $40K
MVS OR VM INTERNALS	$ OPEN
ACF/VTAM/NCP	TO $50K
COBOL/CICS	TO $40K
UNIX INTERNALS	TO $60K+
UNIX/C	TO $55K
COBOL/DB2 OR IMS	TO $48K
EDP AUDITOR	$ OPEN

ROBERT SHIELDS & ASSOCIATES

P.O. Box 890723, Dept. C
Houston, TX 77289-0723
FAX: 713/486-1496

Consultants

Big 8

$30,000 - $65,000+

Positions exist **NATIONWIDE** at all levels for degreed individuals who are willing to travel and have at least two years "hands on" experience with any of the following products:

• M&D	• Tesseract
• Walker	• Integral
• CA	• PeopleSoft
• MSA	• ASK
• JD Edwards	• MAC PAC
• Comshare	• AS400 (RPG)
• CAD CAM	• PRJ (Retail)

Join the exciting field of consulting with a prestigious "BIG EIGHT" firm. Top salaries and benefits are available in most major cities. RUSH resume to:

D C T

Donald C. Thomas & Associates, Inc.
1410 N. Westshore Blvd. #806
Tampa, Florida 33607
Specialized IRM Personnel Services

COMPUTERPEOPLE, INC.

-National Division-

Permanent & consulting opportunities both hourly and salaried nationwide.
We can provide a high level of professional representation to individuals with skills in the following areas.

C/UNIX **$25-$55K**
Relational Database
Windows
Graphics (PHIGS a plus)
Networking

IBM MAINFRAME DATABASE **$30-$55K**
IDMS/ADSO
IMS (Telon a plus)
DB2
ADABASE

SYSTEMS 38/AS 400 **to $50K**

Free Consultation
Call **1-800-955-9695**
Colleen or Noreen

Fax Resume
1-716-883-0776
* Resume not required

---

and the results have been electrifying **Business Week** recently listed CISCORP as the 20th fastest growing high technology company in America during the '80s. Our **great idea** has been an aggressive approach to developing customized systems as a complete project solution at a fixed price.

Strategic partnerships with prestigious hardware and software manufacturers have placed CISCORP on the leading edge of technology. Our extremely forward thinking environment requires us to continuously seek top-notch **Tandem Project Managers, Programmer/Analysts and Analysts** experienced in

Non Stop SQL, TAL, Pathway, SCOBOL or COBOL

We offer limitless opportunity for personal and professional growth, as well as an excellent compensation/benefits program. If you are ready to bolt to our positive career environment, please submit your resume in confidence to **CISCORP, Penn Center West II, Suite 430, Dept. 0218, Pittsburgh, PA 15276, 800/969-0099 or 412/787-3070 (fax). Attention: Kathy Santacroce.**

The vision of tomorrow's technology — TODAY

CISCORP

Atlanta • Baltimore • Cleveland • Dayton • Philadelphia • Pittsburgh • Silicon Valley

An Equal Opportunity Employer

"Our ads in Computerworld had the resumes pouring in and the phones ringing."

— Linda Huebscher
Manager of Employment
Unisys

With more than 60,000 customers worldwide, Unisys is a $10 billion information systems company that applies leading-edge technology to provide the best possible solutions to its customers.

So naturally, says Linda Huebscher, Manager of Employment for the company's Product & Technology Operations division in Roseville, Minnesota, Unisys wants the best technically trained personnel on its team. And for the most successful recruitment of such qualified professionals, Linda explains, Unisys turns to *Computerworld.*

"We recently embarked on two major recruitment campaigns for systems programmers. First, we need to support our development of Unix-related products and services. Second, we seek systems programmers to help us capitalize on our lead in fourth generation language (4GL) technology.*

"We want programmers who are well qualified, aggressive and systems motivated. The market for programmers with Unix kernel and shell development experience is extremely competitive. Just as it is for professionals with backgrounds in C programming, relational database and 1100 systems technology.

"And we are confident we'll find these professionals through Computerworld. *I asked our key systems programmers and managers which periodicals are most widely read by our top programmers. I was told in no uncertain terms that* Computerworld *is at the top of their reading lists.*

"That became clear when we saw the results. Our ads in Computerworld *had the resumes pouring in and the phones ringing. We averaged 28 responses for each ad we ran. But most importantly, we made several very good hires."*

Computerworld. We're helping serious employers and top computer professionals get together every week. Just ask Linda Huebscher.

For all the facts on how *Computerworld* can put you in touch with qualified personnel, call your local *Computerworld* Recruitment Advertising Sales Representative today.

* Unix is a registered trademark of AT&T Bell Laboratories.

COMPUTERWORLD

The weekly newspaper of record for computer professionals.

375 Cochituate Road, Box 9171, Framingham, MA 01701-9171, 800-343-6474 (in MA call 508-879-0700)

An IDG Communications Newspaper

AS/400 S/38

GET TO THE HART OF THE BUSINESS...

...With Whittman Hart, the largest diversified technical services company (dedicated strictly to the AS/400 and S/38 systems) in the country. Providing technical support to many of the top Fortune 20 companies in America, we are the consulting experts, committed to mastering technologies, attending to details and creating solutions. Our accelerated growth and phenomenal success have created a need for talented Data Processing PROFESSIONALS to share in a future of significant challenge and reward in a highly progressive team environment.

We currently require individuals with 2+ years solid System 38, or AS400 experience, RPG III and proficiency in any of the following:

- **Technical Consulting**
- **Design**
- **Education & Training**
- **Data Communications**
- **Project Management**
- **Product Development**

POSITIONS ARE CURRENTLY AVAILABLE IN CHICAGO, LOS ANGELES AND INDIANAPOLIS.

Get to the HART of challenge and reward at Whittman Hart. We offer one of the finest compensation packages in the industry, including high earning potential, project diversity, incentives, paid insurance coverage, relocation allowance and other impressive benefits. Please send your resume in strict confidence to: **Jared Bobo, Director of Recruiting, Whittman Hart, 377 East Butterfield Road, Suite 425, Lombard, IL 60148. (708) 971-2270.** Equal Opportunity Employer M/F.

Whittman-Hart

The Leader in IBM Midrange Solutions

ONE COMPANY.

Keane employees enjoy what all technical professionals want. The stability of full-time consulting work. State-of-the-art technologies including fourth-generation languages, databases and productivity tools. The opportunity to apply their application expertise at Fortune 1000 manufacturers, insurance companies, banks, services companies and government agencies. The chance to work for the premier project-oriented consulting company in the industry. Technical, management and project management training. Competitive salaries, comprehensive benefits, 401K plan, tuition reimbursement, and vacation condominiums. For one career offering endless possibilities, consult with Keane.

PROGRAMMERS/ PROGRAMMER ANALYSTS

If you're a computer programmer with 2-5 years' experience in the following areas, we want to hear from you.

IMS	**TELON**	**IDMS**
COBOL	**ADABAS**	**DCS**
DB2	**System 38**	**CICS**
AS 400	**ORACLE**	**WANG**
PL/1	**ASSEMBLER**	**C**

KEANE

For more information, call Greg Alleyne at 1-800-899-5326 or send/fax your resume to his attention at (301) 752-7695, Keane, Inc., 36 So. Charles St., Suite 2350, Dept. CW, Baltimore, MD 21201. An equal opportunity employer.

ENDLESS POSSIBILITIES.

Connecticut
Delaware
Florida
Georgia
Illinois
Indiana
Maine
Massachusetts
Maryland
Minnesota
New Hampshire
New Jersey
New York
Ohio
Pennsylvania
Rhode Island

LONG TERM OPPORTUNITIES

...exist immediately for experienced (min. 2 yrs.) programmer analysts with the following skills:

- **TANDEM**
- **IBM**
- **VAX**

If you would like more information about a career with a leading edge DP Consulting Firm, please call, write or fax:

Pittsburgh Business Consultants, Inc.
411 7th Avenue, Suite 1401A
Chamber of Commerce Building
Pittsburgh, PA 15219
(412)391-0714
FAX (412)391-0478
Equal Opportunity Employer

Systems Analyst for coordination, & payment of medical & other services to S. A. tourists in U.S. Development of cost analysis & data systems. Spanish/English. Knowledge of med. terms. Bachelor Deg., Systems Analyst (Management Info Syst.). 11-7 pm., 40 hrs. $2,335.10 mo. - $19.46 hrly. OT. Send resume to Job Service of Florida, 701 S.W. 27 Avenue - Room 15, Miami, FL 33135. Re: Job Order # FL 0360655.

NEEDED NOW!

Automated Information Technologies is looking for people with any of the following skills. **Smart Star, ADABAS/ NATURAL, CICS, IMS, DB2,** or **Clipper.** Please call us at:

1-800-755-4555

THIS SPACE FOR HIRE

Call Today to place your recruitment ad.

800-343-6474
in MA, 508/879-0700

FLORIDA

FT. LAUDERDALE - MIAMI - WEST PALM BEACH
TAMPA - ORLANDO - JACKSONVILLE

If you are a Programmer/Analyst, Information Center Analyst, DBA, Systems Programmer, or Software Engineer with experience in any of the areas listed, contact us today. We will provide all the information you need to consider a move to Florida - a better way of life.

• FOCUS	• TELL-A-GRAF	• DB2	• APL
• CASE TOOLS	• CICS	• UNIX, C	• IDMS, ADS/O
• C, X-WINDOWS	• ORACLE	• TANDEM	• ADR/IDEAL
• ASSEMBLER	• AS/400, S/38	• MUMPS	• IMS-DL/I

2005 N.W. 62nd ST. • SUITE #3 • FT. LAUDERDALE, FL 33309
1-800-777-8603 • FAX 305-491-8152

COMPUTERPEOPLE

A Terrific Opportunity

Computer Consulting Group has immediate openings on its consulting staff for talented Programmer/Analysts with 2 or more years experience. Excellent salary & benefits. We're especially seeking:

- **DB-2/CICS**
- **INGRES**
- **C/UNIX**
- **OS/2**
- **NATURAL**
- **IBM 30XX**
- **DEC VAX**

Computer Consulting Group
Contract Professional Services

Research Triangle Area
4109 Wake Forest Rd
Suite 307
Raleigh, NC 27609
1-800-222-1273
FAX (803)738-9123

Senior Systems Analyst. Requires associate's degree in computer science and one year's experience in design, implementation and modification of System Builder and Cue-Bic based software. In lieu of the required degree, will accept an additional year's experience in designing software for PICK operating system. Responsible for systems design, implementation and modifications of software based on the System Builder and Cue-Bic utilities on the PICK operating system. Develop and refine proprietary software based on System Builder utility. Upgrade system to meet modern market demands. Liaise with end-users to provide technical support. Design and develop new proprietary applications based on Cue-Bic utility. Integrate Cue-Bic and System Builder products to provide complete development, modification, implementation, support and maintenance services to end-users. Analyze market needs and design PICK-based solutions. Provide technical advice to sales staff. Travel to end-user sites as needed. 40 hrs./ wk. 8:30 a.m. - 5:00 p.m. Salary range $30,000 - $35,000 per yr., depending on education and experience. Apply with resume to Georgia Department of Labor, 2972 Ask-Kay Drive, Smyrna, Georgia 30082, or to the nearest Georgia Job Service Center. GA# 5457496.

CONTRACTS

New Jersey and Pa

- **RPG III**
- **Oracle**
- **Inquire**
- **Documerge**
- **Pansophic**
- **I.E.F./DB2**
- **Expert Systems**
- **JAD Facilitator**
- **Bachman Techniques**

DEVON CONSULTING

435 Devon Park Drive
Suite 410
Wayne, PA 19087

Phone#:215-964-2700
Fax#:215-964-2708

Member NACCB

Mc Vey & Associates

Contract & Perm Positions Southeast Locations

ADABAS/NATURAL
ASSEMBLER
CICS
COBOL
DB2/SQL
FOCUS
IDEAL
IDMS/ADSO
IMS DB/DC
RPG II & III
S-38/AS400

Call or send resume to:

P.O. BOX 2693
BURLINGTON, NC 27216
919-228-9016

IS PROFESSIONALS

Unprecedented growth has created a need for experienced, talented Programmers, Senior Programmer/Analysts, DBA's and Systems Managers. Current needs include:

IBM

- **CICS, DB2**
- **NATURAL/ADABAS**
- **CSP, CICS**
- **SAGE/APS**
- **IDMS, ADS/O**
- **IMS DB/DC, CICS, SQL**
- **Datacom, CICS**
- **Peoplesoft or Gupta HR**

DEC

- **VAX, C, Oracle**
- **VAX INGRES, ABF, FORTRAN**
- **DEC, Fortran, ASK/Manman**
- **PDP, RSX11M+, DECNET**
- **Q or L Clearance, FORTRAN, DECNET**
- **UNIX, C**
- **A Series, XGEN**

We offer state-of-the-art work environments, excellent compensation, relocation and professional visibility. Send your resume TODAY! (Degree Preferred).

AMERICAN COMPUTER PROFESSIONALS
140 Stoneridge Drive
Suite 350
Columbia, SC 29210
(800) 933-9227
E.O.E.

Quality. You'll find it everywhere you look. From our Boca Raton headquarters to the comprehensive services and information we provide to more than 700 workers compensation insurers. This is NCCI, the nation's largest statistical research and ratemaking organization. Continued expansion has created opportunities in the following areas.

Systems Analysts

As a member of our technical staff, you will design, implement, enhance and maintain our information systems. You must possess 2-3+ years COBOL programming experience, TSO, VSAM, JCL and OS/MVS utilities. IDMS/ADSO expertise is also required. Experience with IBM PC's, d-base III or DB2 is desirable.

Programmer Analysts

The selected candidate will design, implement, enhance and maintain our information systems. You must possess 2+ years COBOL programming experience. A knowledge of TSO, VSAM, JCL and OS/MVS utilities is also required. Experience with IBM PC's is a plus.

NCCI offers a highly competitive salary with regular reviews and a superior benefits package. For immediate consideration, please send your resume with salary history/requirements to Rick Webb, Manager, Employment, NCCI, 750 Park of Commerce Drive, Boca Raton, FL 33487. No phone calls, please. We are an equal opportunity employer m/f.

NCCI National Council on Compensation Insurance

PROGRAMMER/ANALYSTS & SYSTEMS PROGRAMMERS

FOR CAROLINAS AND SOUTHEAST

Numerous opportunities exist for on-line and data base applications P/A's as well as systems programmers and DBA's. Fee Paid Please call or send resume to:

Keith Reichle, CPC
Systems Search, Inc.
203 Heritage Park
Lake Wylie, SC 29710
803/831-2129

(Local to Charlotte, NC)

AS400

PERMANENT PROGRAMMER, PROGRAMMER/ANALYST AND MANAGEMENT POSITIONS AVAILABLE IN MAJOR CITIES THROUGHOUT EASTERN U.S.

RPGIII/RPG400 WORK EXPERIENCE REQUIRED. TOP SALARIES AND PAID RELOCATIONS. OPENINGS IN:

AL, CT, DC, DE, FL, GA, KY, MA, MD, NC, RI, SC, TN, VA

CALL, FAX OR MAIL YOUR RESUME:

JESCAR, INC.
THE RPG SPECIALISTS
12555 BISCAYNE BLVD., #411
N. MIAMI, FL 33181
PHONE (800) 940-7791
FAX (305) 945-9059

HUYCK Huyck Felt
A Division of BTR Paper Group

PROGRAMMER/ANALYST

A leading manufacturer of specialized industrial fabrics for paper industry application is seeking a highly motivated programmer/analyst in the Raleigh, NC area. The ideal candidate will have a B.S. in Computer Science or B.A. in Management Information Systems and 2-3 years professional experience in writing, documenting, maintaining, and training users in application programs to support all aspects of manufacturing data processing. Unisys systems and software experience - DMS, COBOL, 4th Generation language with strong communication/interpersonal skills required, and personal computer skills preferred.

For the qualified individual we offer a challenging career opportunity, with an excellent compensation/benefit package. Please send your resume, complete with salary history and requirements in confidence to:

Huyck Felt
A Division of BTR Paper Group
Attn: Personnel Administrator
P.O. Box 471, Wake Forest, NC 27588-1709

Equal Opportunity Employer / Principals Only

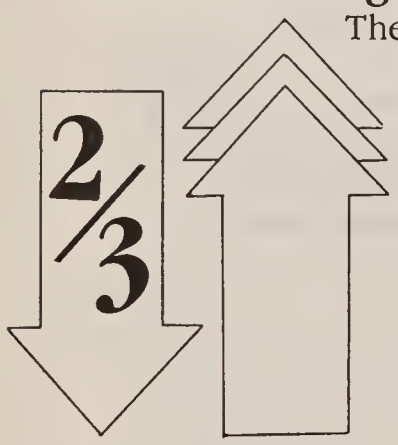
A few important tips on recruiting computer professionals

Finding computer talent isn't as easy as it used to be. In fact, there was a time when you'd just run an ad in the local newspaper and you could make a hire without waiting too long or spending too much.

But times have changed. And like so many facets of today's business, so has the effectiveness of traditional recruiting methods.

What's more, many of today's recruiters *don't use* today's most efficient methods — methods that save time and money for some widely unknown reasons.

The supply of qualified professionals isn't meeting demand



The American Council on Education reports that the number of college students choosing computer careers is down two-thirds since 1982. To make matters worse, there are more computers in today's business that require the skills of this shrinking market than ever before. And while you may never consider the company next door your competitor, it likely *is* competing for the same computer talent today. The result is a classic supply/demand problem that isn't changing for the better -and that's sure to make your recruiting tougher in the '90s.

Ads in local papers don't reach your major hiring market anymore

That's because they generally reach "active" job seekers — those who actively seek out the local newspaper to find jobs — and who a recent *Computerworld* job satisfaction survey found to represent 2 in 10 of today's computer professionals. The study also found that 7 in 10 of today's computer professionals are "passive" job seekers — those who would *consider* new job options, but likely never look for them in the local newspaper. (The remaining small percentage are "non-movers" content with long-term jobs.)

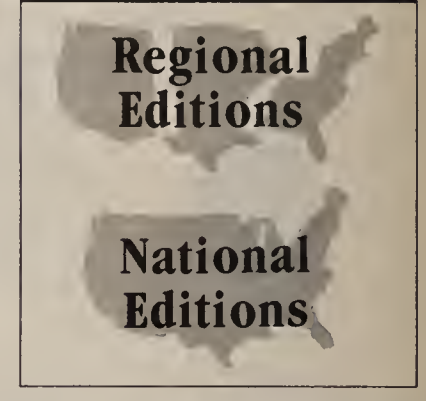
For every 10 of today's computer job seekers . . .
2 are Active ■ ■
7 are Passive ■ ■ ■ ■ ■ ■ ■
1 is a Non-mover ■

In short, this means that your ad in today's local newspaper reaches no more than 20 percent of today's computer job seekers. What's worse, if you're not using other vehicles that reach far more job seekers, your local newspaper expenses are as inefficient as their limited audience.

More job seekers see your ad in Computerworld than in any other newspaper — Sunday, daily, or trade

That's because *Computerworld* reaches over 612,000 qualified computer professionals every week — the largest audience of its kind, and one that's rich with passive and active job seekers.

That's why more companies advertise more jobs in *Computerworld* than in any other professional newspaper. And why *Computerworld* is the *single place* where America's computer professionals *expect* to see the most jobs every week.



Computerworld gives you regional editions

A key option when you need a regional candidate and want to avoid national response and relocation. Yet if your search is national in scope, *Computerworld* can also give you more widespread national exposure than any other source.

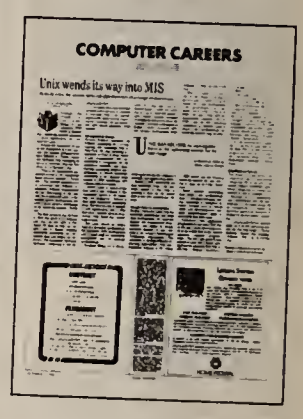
Computerworld needs just 3 working days for your ad to appear

That's comparable to most local newspapers. And why your ad can quickly appear in the next issue to start generating quality response.

Computerworld costs no more than local papers

And with a regional line rate of just $10.80, your cost-per qualified candidate reached is better than *any* newspaper - Sunday, daily or trade. Or just about any other source, for that matter.

Computerworld leads candidates to your ad



Just look at this week's Computer Careers section. You'll find a career editorial topic that will stir the interest of virtually any computer job seeker — passive *or* active. It's just one of countless reasons *Computerworld* is America's newspaper of choice on computing. No matter how much the times change.

And while times may change, some things won't. Whether you *use* computers, *make* computers, or sell products and services *for* computers, *Computerworld* is still your major source of news today. And your major source of computer professionals tomorrow.

For more recruiting tips, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).

Weekly. Regional. National. And it works.

Where do the best computer professionals look for jobs?

Right here. In fact, more computer pros read more computer recruitment ads in *Computerworld* than in any other newspaper.

Talk to the best. Run your ad in *Computerworld*. For more information or to place your ad regionally or nationally, call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700).

Weekly. Regional. National. And it works.

An IDG Communications Publication

Systems Analyst/Database Specialist-Two positions-Analyze, develop, modify and implement software and database support for commercial applications. Design logical databases and files using THIRD normalized form (TNF); Adapt it to physical file structure and determine key fields. Plan transaction flow and assure quality of associated programs. Maintain database integrity by using ADABAS utilities and establish backup/recovery procedures. Determine optimal paths to retrieve data. Customize and implement new software releases and products. Assist in trouble shooting and performance tuning. Write general purpose programs and prepare technical reports for the benefit of staff members. use ADABAS 4 & 5 as DBMS, NATURAL 1 & 2, IBM 370 ASSEMBLER and COBOL and operating system MVS/ESA. Requires BS Computer Science + 2 years experience or 3 years of college with emphasis in computers + 3 years experience. 40 hrs./wk.; $44,000.00/yr. Resumes to Mr. Upbin, Gotham Data Processing Agency, Inc. 50 Clinton Street, Suite 513, West Hempstead, New York 11550.

RESEARCH TRIANGLE OPPORTUNITIES

Currently recruiting experienced computer pros with background in any of the following: IBM COBOL; CICS; IDMS; IMS; ORACLE; Progress; Ideal; Datacom; DB 2; UNIX; HOGAN; Assembler; AS400; DEC/VAX Cobol or Fortran; 2167; Ada; ULTRIX Sys Mgr; SAS; Mfg.; Banking; Insurance; MVS, DOS, IMS or CICS Systems Progrs; DEC/VAX Systems Mgrs; Adabas/Natural; Banyon; DB Analysts. Partial listing of local, regional & nat'l fee paid positions. Call or write:

The Underwood Group, Inc.
3924 Browning Pl., Suite 7
Raleigh, NC 27609
(919) 782-3024
FAX (919) 783-0492

STATISTICAL ANALYST/PROGRAMMER - For fin'l & scientific statistical systems, plan & develop data collections, determine methodology for statistical analysis as well as quantity of information required. Define detail systems requirement, complex data structures & algorithms, system design & analysis, testing & interpreting statistics to client. Customize statistical database using IDMS; maintain & enhance systems. Must know: FORTRAN, VAX/VMS & IDMS/COBOL, database programming, intelligent systems. Bach-Math. &/or Statistics + 2 yrs exp in job or 2 yrs exp as at least a Sr. Programmer. $37,000/yr 40 hr wk. Apply by resume to: N.H. Dept. of Employment Security, Attn: Job Order #91-9, Employment Service Bureau, 32 South Main St., Concord, NH 03301-4857.

Declare Your Independence

In today's world of mergers and buyouts, your future with a company can be uncertain. You owe it to yourself to take charge of your career and declare your independence.

TECH FAIR® offers an excellent opportunity for engineers and computer systems professionals to meet face-to-face with high technology companies who can show you what's available in today's high tech career marketplace.

At TECH FAIR, you can find out what you're worth, explore new career possibilities, get a closer look at projects and position openings, all in an informal, no pressure atmosphere.

So, come to TECH FAIR and declare your independence. There's a TECH FAIR coming to your area soon.

NOVEMBER TECH FAIRS

November 12-13
Boston Marriott, Burlington MA

November 14
Guest Quarters Suite Hotel, Cambridge MA

November 19-20
Sheraton Premiere, Washington DC

Free Admission
Show Hours: 3PM-8PM
Cambridge Hours: 3PM-7PM

TECH FAIR BPI®

TECH FAIR is a Trade Mark of Business People Inc.
Sponsored by BPI. For corporate information call: Mpls 1-800-328-4032; Boston, 508-988-0881; Washington DC, 301-340-6706; Los Angeles, 714-662-3105; Dallas, 214-490-7330. We are not an employment agency.

*** IMMEDIATE CONSULTING & FULL TIME OPPORTUNITIES:**
LIFE/70
LIFECOMM
SYNON
M&D Purchase Order
AS400/LAN
(Spanish nec)

The Allegiance Group
Cell Sun or anytime
(212) 421-7255
Send res to: Dan Greenburg
1 Penn Plaza, Suite 100, New York, NY 10001

Great CONSULTING Assignments! and Exceptional FULL TIME Opportunities

Call & send your resume to

MIMI SIMON ASSOC.
90 West Street, Suite 1105
New York, NY 10006

(212) 406-1705
Fax # (212) 406-1768

When you compare costs and the people reached, Computerworld is the best newspaper for recruiting qualified computer professionals.
Place your ads today!
Call toll-free 800-343-6474
Or in Mass (508) 879-0700

PROGRAMMER II (ICS DEPARTMENT)

City of St. Petersburg
SALARY $27,019-$36,442

Challenging opportunity in the Information and Communication Services Department for a skilled Programmer.

Candidates should have at least a four year degree in Computer Science or a related field. Subsequent experience of at least two years at the programmer/analyst level and AS/400 development experience is required. Must have a thorough knowledge of CL, RPG III or AS/400, COBOL, DDS, and SEU. A good understanding of DOS/VSE, CICS and command level COBOL and some experience converting applications from the IBM 370 environment to the AS/400 (or System 38) is a definite plus. Experience with the SYNON Case tool is desirable. Excellent written and verbal communications skills and the ability to conduct formal/informal training with the programming staff is required.

Interested persons should submit a resume to the Employment Office, P.O. Box 2842, St. Petersburg, Florida 33731. Closing date December 7, 1990.

Veteran's preference will be awarded in compliance with Chapter 295 of the Florida State Statutes.

Equal Opportunity Employer

COMPUTER PROGRESS UNITED
$40,000 to $60,000

We provide Fortune 500 companies with consulting and programming services. We have immediate positions available for **P/A** in **Kentucky, Ohio, Indiana,** and **Tennessee. We are the DB2 Specialist!**

TELON
DB2 ■ IMS ■ CICS

Send resume or call:
Computer Progress United
12730 Townepark Way
Louisville, KY 40243
(502) 245-6533

ASSISTANT MANAGER
Financial Information Systems

GEISINGER SYSTEM SERVICES is the management support group for a large multi-institutional health care system in northeast Pennsylvania. The system includes a 577-bed regional tertiary referral medical center, a 230-bed acute care secondary referral center, alcohol/chemical dependency treatment facilities, 46 physician group practice sites, and HMO and other health care affiliates.

Our centralized Information Systems Department in Danville has an opportunity for an Assistant Manager to direct financial systems activities, including systems analysis, design, testing, implementation and user interface.

A Bachelor's degree in computer science, related fields or equivalent, is required. Seven years of progressive information systems experience with two years of project management and supervisory experience essential. Experience with D&B software (MSA) financial applications is preferred.

GEISINGER SYSTEM SERVICES

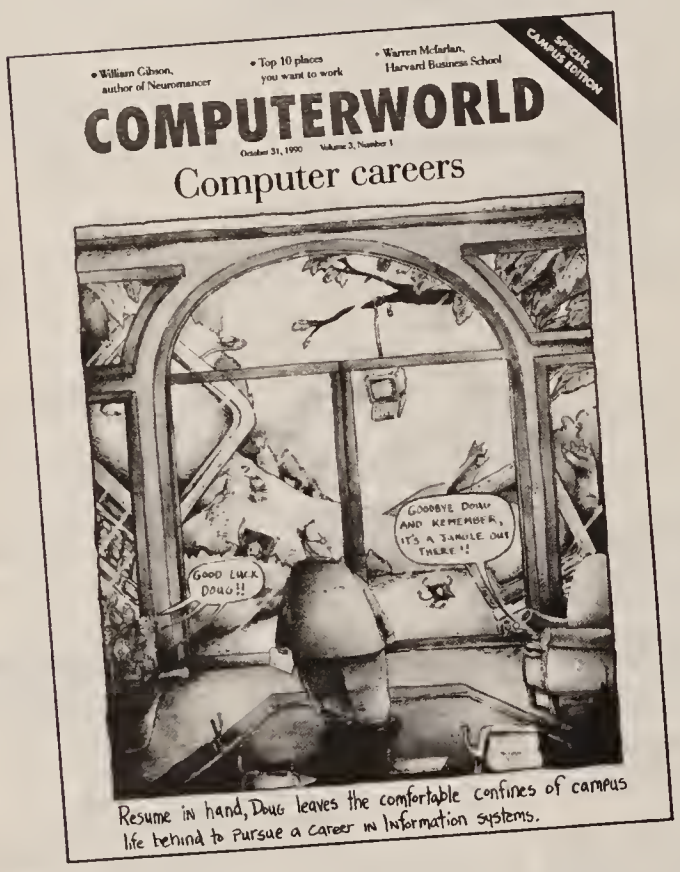
...offers competitive salary and benefits package, including 19 days vacation, 401(K) with 5% employer contribution, our own HMO or Blue Cross/Blue Shield and relocation assistance program. Please send your resume and salary requirements to: **Human Resources 30-12AM/I, Geisinger System Services, Danville, PA 17822.** Equal Opportunity Employer M/F/H.

Geisinger®

Now you have a better way to recruit university and college students planning computer careers:

Computerworld's fourth annual Campus Recruitment Edition

Issue Date: October 31, 1991
Close: September 27, 1991



Resume in hand, Doug leaves the comfortable confines of campus life behind to pursue a career in Information Systems.

If you recruit top computer career students on America's campuses, your message in this special issue will target more of them than any other newspaper or magazine!

Now you can recruit computer talent on campus without leaving your office!

That's because 135,000 copies of this special issue will be distributed to America's best and brightest students enrolled in Information Systems (IS), Computer Science, Computer Engineering, Electrical Engineering, and just about any other computer-involved curricula.

Finally you can cost-effectively reach the quality and quantity of students you need!

And you can do it with just one ad in *Computerworld's Campus Recruitment Edition!* For a rate card reflecting complete campus distribution, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700). But hurry . . . this issue closes September 27, 1991!

Planned Editorial Features:

(subject to revision)

- Companies where computer career students want to work. And their top choices for: Information Systems, Engineering, Sales & Marketing, Technical Support, Research & Development.
- Prospects for minorities in computing.
- Merits of an Electrical Engineering degree for a computer career.
- Information Systems salaries from Computerworld's annual survey with the Data Processing Management Association.

PRINCIPAL TECHNOLOGIST required. Identify and evaluate emerging technologies which use the principles of Object Orientation. Build and meintain an informetion technology architecture to support the integretion of Object Oriented technologies with conventional technologies. Assure user and data processing menagement ewareness of Object Oriented technology opportunities within the context of overall corporete goals. Provide consultancy in the arees of Object Oriented programming systems, user interfaces, databases and enelysis/design techniques. Identify eppropriate opportunities for the epplication of Object Oriented technologies with the company. Provide project management skills to launch and sustain development projects using Object Oriented techniques to ensure maximum value to organizetion. Applicants required to have a Bechelors Degree or its equivelent in meth, computers or engineering with at leest eight years large scale information systems development and support experience. Experience must include: four years of system design and implementation in lerge host systems VM and MVS environment; three years systems implementation using PCs, "C", Microsoft Windows, OS/2 Presentation Manager end 3270 emulation; plus one year of Object Oriented Systems design and implementation work in large scale environment. Annual salary will be $55,000.00 per year for e 40 hour work week. Additional salary up to $62,000.00/yeer may be paid if education and experience warrant. Interested applicants apply at the Texas Employment Commission, Ft. Worth, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, TX 78778-0001, J.O. number 5757330. This advertisement was paid by an Equal Opportunity Employment Employer.

DIRECTOR OF RESEARCH AND DEVELOPMENT required. Will direct the operations of a research and development staff in the analysis and design of en integreted computer hardware and software system for client firms using Information Engineering techniques. Will apply overell knowledge of computers, computer lenguages, database structures, spreadsheet progrems, drawing and presentetion programs (graphics), editors and wordprocessors, end man/machine interface techniques to development of an overall computer solution to a client firm desiring to eutomate. Will implement design using overell knowledge of design techniques, network theory and configuration manegement. Will manage and coordinate the development team as well as the training of the client staff. Will ect as liaison with client management to insure that completed system satisfies all original concerns and expectations without running over budget. Applicants required to have bachelors degree or its equivalent in math, computers or engineering with at least 4 years experience managing the integration of a networked computer system. Experience must include two years experience with structured design techniques (such as Yourdon); two years with digitel network theory (token-ring to fibre-optic) and open system interconnection (OSI) models; two years with configuretion management and problem reporting tools; end at least one year experience working with an ACP/TPF and AADN real time environment. Annual salary will be $62,500.00 per year for e 40 hour work week. interested applicants epply at the Georgia Department of Labor, J.O. number GA5460072, 2972 Ask-Kay Drive, Smyrna, Georgie 30082, or to the nearest Georgia Job Service Center. This ed was paid by an Equal Opportunity Employer.

System Software Engineer, Entry Business Unit Group. By 12/19/90 please send resume to: Employment Security Department, ES Division, Att: Job #238045-O, Olympia, Washington 98504. Job Description: Designs, implements and tests complex and high level systems and software for micro computers. Works with other engineers to design Works applications software utilizing MS-DOS, OS/2 and Windows operating systems and "C", 8086 Assembler Series and Postscript languages. Designs graphical user interface and reel-time, interrupt driven software, including serial communications. Assumes major project responsibility including: 1) requirements and analysis of project specification; 2) product design; and 3) implementation schedules. Requirements: B.A. or B.S. in Electrical Engineering, Computer Science, Mathematics or Physics. Six months of work experience in computer design or programming utilizing MS-DOS, multitesking and Windowing operating systems, "C", 8086 Assembler Series and Postscript langueges and designing graphical user interface software. 20 course hours in real-time programming and software control of low-level hardware devices. Must have proof of legal authority to work in the United States. Job location: Redmond, Washington. Salary: $29,000-38,000 per annum, depending on experience. 40 hours per week, flex time. EOE

Engineering Systems Engineer

Executes software development life cycle for computer systems, which includes designing, coding, testing and validating software programs that solve engineering/manufacturing-related problems using computer-aided technologies. Performs work which involves solving engineering system problems through the development of algorithms based on engineering theory. Applies an understanding of engineering/manufacturing processes, standards and task controls to devise solutions through analysis, design and implementation of computer software as well as integration of software with CAD/CAM and other third party engineering software. Performs porting of engineering software to computer workstations used in the design, engineering, tooling and manufacturing operations.

Education Required:
Bachelor of Science in Mechanical, Civil or Aeronautical Engineering. Academic course work must include 3 credit hours in each of the following: numerical methods, finite element structural analysis, computer optimization.

The minimum working hours are 40 hours per week, with a starting salary of $37,200 per year. This ad is employer paid.

Please send resume in confidence to: Michigan Employment Security Commission, 7310 Woodward Avenue, Room 415, Detroit, Michigan 48202.
Reference No. 73090.

An Equal Opportunity Employer M/F/V/H

Software Project Engineer to work in Manufacturing Automation Protocol (MAP) development, responsible for design, implementation, and test of software for an international Standards Organization (ISO) Directory Client/Server System. This position involves development of Directory System Agent (DSA), Directory User Agent (DUA), and Directory Access Protocol (DAP) to form a complete ISO Directory system. Implementation must conform to existing ISO specifications for Open Systems Interconnect (OSI) including Abstract Syntax Notation One (ASN.1), Remote Operations Service Element (ROSE), Association Control Services Element (ACSE), and Directory Services (X.500). Implementation will be required on both MVS and UNIX platforms and include development of an Application Programming Interface (API) and user command language interface (CLI) for access to Directory Services. Duties include developing documentation including functional specifications, engineering plans, project status reports, technical manuals, and test methodologies. Participate in new product planning with engineering groups. Use C language to develop Directory components in modular architecture. Implement test suites to verify product conformance to X.500. Requirements for this position are: A Master of Science in Computer Science with specializatoin in OSI networking; knowledge of ISO OSI specifications for ASN.1, Abstract Service Definition Conventions (X.407), Remote Operations, The OSI Directory (X.500), and ACSE; background in OSI Application protocol design and development; knowledge of VMS and UNIX operating systems and C programming language. Salary: $39,291; 40 hr/wk. 8:15-5pm. No exp. req. If you are interested in, and qualified for the above position, please forward (2) resumes to: Attention: Job Order #1041, Massachusetts Department of Employment and Training, Special Programs Unit, Charles F. Hurley Building, 19 Staniford Street, Government Center, Boston, MA 02114

Specialist - College of Education for state university to coordinate information processing systems for College of Education research, teaching and service activities; consult with college personnel on support needs for research, instructional programs, student advisement/affairs and outreach to public school districts; design, develop, maintain and upgrade complex computer communication and network systems, consisting of 400+ workstations, including links with public school sites for professional development end research; identify, evaluate and recommend network and personal computer hardware and software systems; develop and implement group-productivity systems using local area networks; design and oversee research and operational database systems related to bibliographic, inventory, accounting, student/personnel records and mainframe computer accounts; supervise support personnel in installation and maintenence of computer facilities; teach one or more graduate courses each year in educational systems development; develop end implement user-training materials, short courses and workshops for database, word processing, electronic mail, office automation end desktop publishing; develop computer support expenditure budget documents; perform policy, procedural, organizational and/or operational studies. Min. Qual.: Masters-Education; Masters-Computer Science; graduate program in Computer Science must include at least one course each in Network Design, Large Database Theory, Accounting Information Systems; one (1) year related occupetion of Research Assistant/Graduate Research Assistant; one year related experience in a progremmatic educational R&D center, involving design, execution end publication of research under standards established by relevant professional/scientific organizations (e.g., American Psychological Association (APA). $40,000/yr; 8am-5pm, M-F. Resume to: Michigan Employment Security Commission, 7310 Woodward Ave., Rm 415, Detroit, MI 48202. Ref. No. 76690. AN EQUAL OPPORTUNITY EMPLOYER PAID AD.

Systems Consultant for firm in NE Ohio. To design, develop, and implement computer softwere and computer systems for use in computer networks, particularly Local Aree Networks (LAN) and data communications, for company clients. Must heve M.S. in Computer Science end ecademic program must have included one course each in: Network Engineering, Mini-Micro Computers, Data Communications, and Intelligent Systems. Must have one year of experience in software engineering end experience must have been in designing and developing softwere systems for data communications; including Local Aree Networks. 40 hrs/wk., 8:30am-5pm, $35,500/yr. Must have proof of legal authority to work permanently in U.S. Send resume and course transcript **in duplicate** (no calls) to J. Davies, JO#1255628, Ohio Bureau of Employment Services, P.O. Box 1618, Columbus, Ohio 43216.

Software Engineer for NE Ohio computer software development firm to design & analyze system schema for software system; develop software in C Language & SQL database language for use on IBM mainframe, VAX, & IBM-PC; maintain & update existing systems; develop advanced optimization package using mathematical algorithms & operation research. No exp. req. in position above. 18 mos. exp. as a Systems Analyst (1 yr. exp. as a systems analyst must be in IBM mainframe, VAX, & IBM PC, using C Language, & 6 mos. exp. must be in SQL database language) & e B.S. in Computer Science (must heve taken et least 2 courses in Operation Research & 3 courses in mathematics) required. M-F 8:00AM-5:00PM. $2,945/mo. must have proof of legal authority to work permanently in U.S. Send resume in duplicate (NO CALLS) to J. Davies, JO# 1255629, Ohio Bureau of Employment Services, PO Box 1618, Columbus, OH 43216.

Work In An Energy Driven Environment.

CAROLINA POWER & LIGHT COMPANY is a major force in Southeastern power generation and distribution. We offer information systems professionals a fast moving environment with the latest in proven technology.

Along with wide use of personal computers, we're operating one IBM 3090-300, one IBM 3090-200, and one Amdahl 5890-300. The CICS on-line environment has been growing at the rate of 40% per year. Recently, we have expanded to a new Data Center. We're operating under MVS/XA and VM/CMS utilizing an SNA/SDLC network consisting of over 3,000 terminals and printers. Our programming languages are COBOL, SQL and DATACOM's IDEAL. We have adopted DB2 as our standard for new application development and are aggressively expanding our use of PC-based and mainframe-based CASE tools.

We have recently completed a large strategic planning study and have a significant backlog of technical and application development projects. We are currently seeking the following:

APPLICATIONS DEVELOPMENT

PROGRAMMERS

Positions require 4+ years of structured coding experience. Highly desired experience would include COBOL, CICS, DB2 and DATACOM. A four-year degree is preferred.

SYSTEMS ANALYSTS

Positions require 4+ years experience in a development environment versus a maintenance environment. Highly desired experience would include structured design techniques, data modeling experience, prototyping and Method/1 knowledge. A four-year degree is preferred.

DATABASE ANALYST

Position requires 4+ years experience utilizing a relational database engine, preferably DB2. Desirable experience includes formal participation in the physical DB design activity of development projects. A four-year degree is preferred.

LAN SUPPORT ANALYST

Requires 3-5 years of technical experience in personal computer support, including a minimum of 1-2 years in the design, implementation and support of Local Area Networks, preferably in a LAN-to-LAN or wide area connectivity environment. Banyan network operating system experience strongly desired. Candidates must possess strong verbal and written communication and client consulting skills. A four-year degree is preferred.

There are few areas in the country as attractive as the Carolinas. The landscape is famous for its rolling hills and magnificent fall colors. The capital city of Raleigh, location of our headquarters, is known for its nationally recognized university programs, sports and proximity to both beach and mountain resorts. Despite its growth, the region has maintained a moderate cost-of-living and its southern charm.

CP&L offers competitive salaries, excellent benefits, and opportunities to advance. If you're interested in becoming part of our important team of professionals, send resume with salary requirements to: **Mary Anne Lynch, Senior Recruitment Representative, Dept. CW111990, CAROLINA POWER & LIGHT COMPANY, P.O. Box 1551, Raleigh, NC 27602.** An Equal Opportunity/Affirmative Action Employer.

CP&L

Carolina Power & Light Company

Energy In Operation

SAN FRANCISCO BAY AREA

The Bay Area continues to hire . . . New openings require the following skills:

• DEC/VMS	Programmer/Analysts, Systems Programmers
• IDMS/ADSO	Programmers, Analysts
• AS-400	Programmers, Analysts
• C/UNIX	Programmers, Systems Administrators
• DB2	Programmer/Analysts, Project Leaders
• RDBMS	All levels of ORACLE, INGRES, INFORMIX, and SYBASE

THE SEARCH FIRM, INC.
595 MARKET STREET, SUITE 1400, SAN FRANCISCO, CA 94105
(415) 777-3900 FAX 777-8632

Analyst/programmer Portland OR area. Utilzng on-site h'ware/s'were, provide client spcfd expertise to install/enhance cmptr systms spprtng various biz, commrcl, finc'l appls. Respons for systems enalysis, design, prgrmng, testing. Prvde tech esstnce & trng; dcmnt all work; write user/tech manuals. Rqmnts: Bachelor's Comp Sci or Math or Engrng + 2 yrs exp either (a) in job offrd, or (b) Programmer exp to incl systms analysis/design exp usng stiplld tech. Expertise req'd in IBM h'ware/utilities, COBOL, PL/1. 40 hr/wk, 8 am - 5 pm. $34,000/yr. Resume to: Employment Division, Attn: Job Order no. 5550067, 875 Union St NE, Rm 201, Salem, OR 97311.

GIS Software Designer - perform conceptual & function design & implementation of software for geographic info. systems (Vector & Raster). Ph.D in Geography + 3 yrs on job or in research positions in remote sensing and comp. cartography. Know Comp. image processing, spatial & statistical analysis, ARC/INFO programming, VAX/750, 780, 785, Primer, UNIX/C, F77 & LISP. $59,000/yr. Job & interview at Redlands. Send this ad & your resume to Job #NOF1038, P.O. Box 9560, Sacramento, CA 95823-0560 not later than 12/4/90.

FLORIDA

D.P. PROFESSIONALS TO $50K+

Immediate openings for professionals with any of the following skills:

CICS	UNIX/C	INFORMIX
FOCUS	PL/1	ORACLE
OB2/SOL	VAX	IMS OB/OC
AS400-S/38	CASE TOOLS	M&O OR MSA
IOMS	IMS	S/P MVS
MVS/ALC	HP3000	PC/C
TANOEM/TAL	PATHWAY/SCOBOL	AA/OCS

Please call or send resume to Dept. 506

2005 W Cypress Creek Rd Suite 3 Ft Lauderdale FL 33309	12225 28th St N St Petersburg, FL 33716	20 North Orange Ave Suite 1400 Orlando, FL 32801
800-777-8603	813-573-2626	800-888-1064
305-771-8603	800-888-1064	*Serving Jacksonville & Orlando*
Serving South Florida	*Serving Tampa Bay*	

COMPUTERPEOPLE

CAMERON

MOVE UP IN 1991
Contracts & Fulltime
Help us celebrate our **15th year** in business by finding you your next position!!!

SACRAMENTO OPPORTUNITIES
- **IBM, MVS** Lead, Sr. & Jr. Operators
- **IBM, MVS** Lead Operations Supervisor
- **IBM** Manager, Systems Software
- **IDMS, COBOL, ADSO** Sr. P/A, P/A, Bus & Sys Ana
- **ADABAS, NATURAL** Sr. P/A, P/A

SAN FRANCISCO BAY AREA
- **CICS** Project Leaders end Managers
- **IBM Q/A** Analysts and Technicians
- **CICS • IMS • DB2 • IDMS • DEC VAX/VMS**

Sr. P/A, P/A, Business & Systems Analysts

SOUTHERN CALIFORNIA
- **AS400 • DB2 • IMS**
- **ADABAS/NATURAL • CICS**

Sr P/A, P/A, Business & Systems Analysts

We invite you to send your resume or call:

THE CAMERON GROUP, INC.

Northern California
Val Giudice
800 Airport Blvd., #404
P.O. Box 4408
Burlingame, CA 94011
1-(800) 447-4408
Fax (415) 375-0338

Southern California
Jerry Beck
100 Cliff Drive
P.O. Box 4232
Laguna Beach, CA 92652
(714) 476-0700
Fax (714) 494-3248

Systems Analyst for firm in central Ohio. The Investment Product Operations (IPO) area is responsible for administering all the firm's annuity and pension business. Within IPO, the Systems Programming area coordinates all components of the computer hardware and software systems which administer the firm's complex annuity and pension business. The Systems Analyst is responsible for analyzing problems which may arise anywhere within the computer systems dealing with annuity and pension matters, providing recommendations as to how to resolve them, and implementing the resolution of those problems which are highly complicated and/or complex (such as modifying existing programs or correcting invalid data). The position also involves theoretical analysis and design of the entire systems; as well as training the programmers and other technicians involved in the day-to-day running of the system. An important responsibility is to consult with senior management and recommend ways to improve all aspects of the firm's annuity and pension business. Must have B.S. in Computer and Information Science and ecademic program must have included one course each in: Principles of Programming Languages, Introduction to Operating Systems, Introduction to Database Systems, and Data Structures. Must have 2 years experience in computer programming and must have extensive knowledge of annuity and pension business and be able to analyze, design, and implement complex pension programs using the software packages PAS, PAS GO, and PAS LOAN, as evidenced by academic and/or employer testimonials. Must pass standard prescribed programming proficiency test. 40 hrs/wk, 8am-5pm, $31,550/yr. Must have proof of legal authority to work permanently in U.S. Send resume and course transcript **in duplicate** (no calls) to J. Davies, JO#1260236, Ohio Bureau of Employment Services, P.O. Box 1618, Columbus, Ohio 43216.

System Software Engineer, Networking Group. ISV Account Manager. By 12/19/90 please send resume to: Employment Security Department, ES Division, Att: Job #238436, Olympia, Washington 98504. Job Description: Designs, implements and tests complex end high level systems and software for micro computers. Responsible for strategic marketing of networking software (including OS/2 LAN Manager, SQL Server and Mail Server) to Independent Software Vendors (ISV's) in the United States and foreign markets. Works with other engineers to design, modify and adapt networking software for use with software applications manufactured by ISV's. Utilizes MS-DOS And UNIX Operating Systems And "C", SQL And Smalltalk Languages. Assumes major project responsibility Including: 1) requirements and analyses of project specifications; 2) product design; and 3) implementation schedules. Requirements: B.A. or B.S. in Electrical Engineering, Computer Science, Mathematics or Physics. Six months of work experience in computer design or programming utilizing networking systems software, MS-DOS and UNIX Operating Systems, and "C", SQL and Smalltalk Languages. 20 course hours in business/marketing analysis or six months of work experience in business marketing. Must have proof of legal authority to work in the United States. Job location: Redmond, Washington. Salary: $34,000 per annum, depending on experience. 40 hours per week, flex time. EOE

PROGRAMMERS
Contract Assignments
$24-28/Hr.
+ Per Diem.

The best in the Sunbelt

Jr to Sr level programmers with 1+ yrs exp in IBM C PL 1 ASSEMBLER & other high-level languages Contract assignments 12 18 mos + $24 28 Hr + per diem +

Contact Al Madsen, C.E.C.
CORPORATE PERSONNEL CONSULTANTS, INC.
P O Box 221739
Charlotte NC 28222
(704) 366-1800
FAX (704) 366-0070

Sai Software Consultants, Inc.

Sai, one of the fastest growing contract programming and consulting firms, with offices in ***Houston, Dallas, and Washington D.C.*** *has immediate openings for talented programmer/analysts.*
We are looking for:

UNIX, C, ADA/ORACLE
REAL TIME APPLICATION
VAX/FOCUS (WASH. D.C.)
UNIX, C, DEC WINDOWS
SYS 36/36, COMMUNS (NY)
APS DEV. CENTER
SQL, DBA

Please call, fax or mail resume to:

Sai Software Consultants, Inc.
2330 Timber Shadows Ste 2021
Kingwood, Texas 77339
1-800-868-2748
(713) 358-1858
Fax (713) 358-8952

Systems Consultant: Analyze needs companies advice implementation multiuser/multitasking tech using UNIX/XENIX environment or local area network NOVELL ELSI, ELSII. Use knowledge specialized computer interfaces; exp. line data transmission thru modulation - demodulation devices. Analyze data to plan layout & install multiuser syst/network, type comp. & peripheral equip or modify exist equip to assure compatibility & capability new syst for mgt goals. Use TURBO BASIC, COBOL, BASIC, "C", DBASE III+ languages for comp. applications & customer support. Implement software syst to meet operating syst compatibility & customers' needs. Install & modify SBT software for accounting applications. Recommend & implement new communication tech. Negotiate contracts for consulting serv. Develop & conduct training classes clients' personnel. Supervise 3 employees. Must have min B.S. or equiv. electrical/electronic eng/comp sci + 2 yr exp same job or 2 yr exp systems manager; verifiable refs. Hrs: M-F 9:00AM-5:00PM. Salary: $29,000/yr Submit resume only to Job Service of Florida, 701 SW 27 Ave., Rm 15, Miami, FL 33135. Ref: J.O. #FL 0363036

MAINE - NH
$25,000 - 50,000
Salary

ROMAC, the largest and oldest placement agency in this area, is seeking qualified data processing professionals with salary requirments in the $25,000-$50,000 range. Our clients pay our fees.

ROMAC®
Att: Dept. 2
P.O. Box 7040
Portland, ME 04112
(207) 773-4749
FAX (207) 773-2645

UNISYS

PROGRAMMERS

COBOL/DMS II	to $46K
DMS1100	to $46K
MAPPER	to $45K
LINC	to $50K
DBA's	to $55K
EXEC or MCP	to $60K
TRAVELING P/A's	to $45K

Permenent placement for UNISYS Programmers and Analysts throughout the US. FREE service to candidates

COMPUTER STAFFING
call 800/88UNISYS

It's easy to place your recruitment ad in Computerworld!

All the information you need is right here. Just call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700). Or, if you want, you can send us the form below via mail or to our FAX machine. You can reach our FAX at ext. 739 or 740 at either of the above numbers.

The following information will help you determine the size ad you'd like to run and when you'd like to run it.

CLOSING DATES: To reserve space, you need to call us by 5PM (all continental U.S. time zones), 6 days prior to the Monday issue date. We need your ad materials (camera-ready mechanical or copy for pub-set ad) by 5PM, 5 days prior to the weekly issue.

AD COPY: We'll typeset your ad at no extra charge. You can give us copy via phone, U.S. mail, or FAX. To typeset an ad for you, we need clean, typewritten copy. Figure about 30 words to the column inch, not including headlines. (There are seven columns on each page.)

LOGOS AND SPECIAL ARTWORK: Any logos or special artwork should be enclosed with your ad copy. For best reproduction, please send us either a stat of your logo or a clean sample on white bond paper.

COLUMN WIDTHS AND MINIMUM DEPTHS: Your ad can be one of seven different widths. There is a minimum depth requirement for each width. You can also run larger ads in half-inch increments. The chart below can serve as a reference.

NUMBER OF COLUMNS	WIDTH	MINIMUM DEPTH
1 column	1-1/4″	2″
2 columns	2-5/8″	2″
3 columns	4-1/16″	3″
4 columns	5-9/16″	4″
5 columns	6-15/16″	5″
6 columns	8-3/8″	6″
7 columns	9-3/4″	7″

RATES: Your rate will depend on the size of your ad and whether you choose to run regionally or nationally. The national rate is $14.85 per line or $207.90 per column inch. The regional rate (Eastern, Midwestern or Western editions) is $10.80 per line or $151.20 per column inch. You can run your ad in any two regions for $13.50 per line or $189.00 per column inch. In all cases, you can earn volume discounts.

The minimum ad size is two column inches (1-1/4" wide by 2" deep) and costs $415.80 if run nationally. A sample of this size appears below. You can run larger ads in half-inch increments at $103.95 per half inch. Box numbers are available and cost $25 per insertion ($50 if foreign).

Programmer Analyst

This is a sample ad for Computerworld's Computer Careers section. It will help you decide what size ad you'd like to run. Remember that you can run your ad either regionally or nationally in our recruitment section and that the minimum ad size is one column (1 4/16 inches wide) by two inches deep (like this sample). This ad would cost $415.80 in our national edition, $302.40 in the Eastern, Midwestern, or Western edition, and $378.00 in two regions; volume discounts apply.

SAMPLE AD SIZES AND PRICES: To assist you in planning your recruitment advertising, the following shows common ad sizes and their respective costs.

	One Region (East, Midwest or West)	*Two Regions (East/West East/Midwest, Midwest/West)*	*National Edition*
1 column x 2″	$ 302.40	$ 378.00	$ 415.80
2 column x 2″	$ 604.80	$ 756.00	$ 831.60
3 column x 3″	$1,360.80	$1,701.00	$1,871.10
4 column x 5″	$3,024.00	$3,780.00	$4,158.00
5 column x 7″	$5,292.00	$6,615.00	$7,276.50

PAYMENT: If you're a first-time advertiser or if you haven't established an account with us, we need your payment in advance (or with your ad) or a purchase order number. Once you have established an account with us, we'll bill you for any ads you run as long as your payment record is good.

COMPUTER CAREERS NETWORK BUYS: You can take advantage of special rates that let you run your ad in *Computerworld* and *Computerworld*'s sister newspapers at special rates. Choose from *Computerworld Focus on Integration, Network World, InfoWorld, Digital News and Federal Computer Week. Call for details.*

Computerworld Recruitment Advertising Order Form

Ad Size:_____ columns wide by _____ inches deep

Issue Date(s): _____

Name: _____

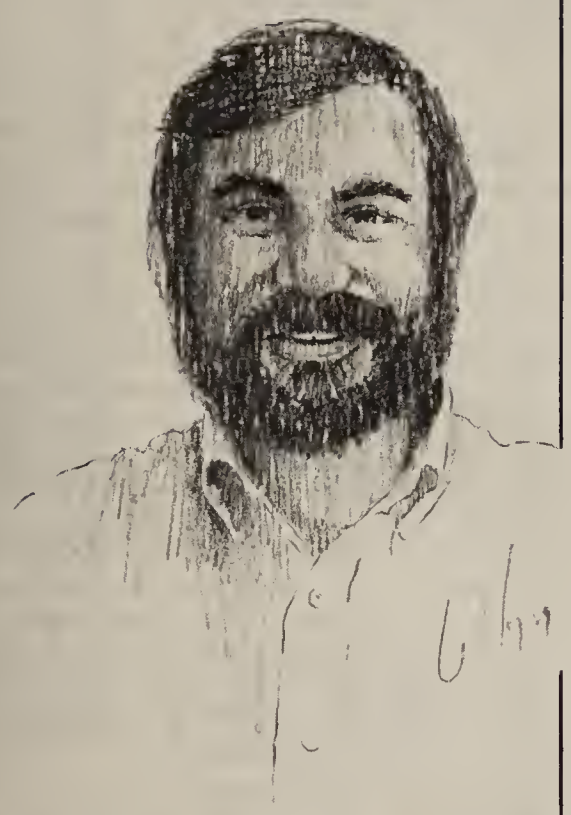
Company: _____

Address: _____

Telephone: _____

Region: ☐ East ☐ Midwest ☐ West **National:** ☐
☐ East/Midwest ☐ Midwest/West ☐ East/West

Send this form to: **COMPUTERWORLD RECRUITMENT ADVERTISING**
375 Cochituate Road, Box 9171, Framingham, MA 01701-9171
800-343-6474 (In MA, 508-879-0700)
Telecopier Extensions: 739 or 740



". . . In terms of leads generated per dollar spent, Computerworld Response Cards give us the greatest cost efficiency."

— Rogers Faden
President
cfSOFTWARE

Having enjoyed 40 per cent growth the past couple of years, cfSOFTWARE has found its niche marketing two unique communications solutions in the IBM and IBM-compatible arena. Across-the-Boards, a standard application programming interface, and pcMAINFRAME, a file transfer system, both enable mainframes and microcomputers to talk to one another. According to Rogers Faden, President of this Chicago-based company, targeting users whose applications require this type of cross-communication is key to their continued success.

"Computer and applications managers within mainframe shops, as well as developers at software companies and mainframe installations, are our primary audience. We know that Computerworld is the publication that delivers our message to the greatest number of mainframe sites we need to reach. That's why we advertise in Computerworld Response Card Decks.

"Overall, card deck advertising is a cost-effective way to generate inquiries with fast, easy turnaround. And we've found that especially true with Computerworld Response Cards. In fact, in terms of leads generated per dollar spent, Computerworld Response Cards give us the greatest cost efficiency.

"And unlike some other decks whose leads are often worthless, Computerworld Response Cards consistently generate high quality leads. Leads that help us achieve our most direct goal of converting serious inquiries into sales.

"Experience tells us that Computerworld Response Cards deliver the greatest depth of coverage within the organizations we're targeting. And that increases our chances of reaching all the right people — every time. In the foreseeable future, Computerworld Response Card Decks will definitely continue to be an important part of our advertising plan."

Computerworld's Direct Response Cards give you a cost-effective way to reach *Computerworld's* powerful buying audience of over 134,000 computer professionals. They're working for cfSOFTWARE — and they can work for you. Call Norma Tamburrino, National Account Manager, *Computerworld* Direct Response Cards, at (201) 587-0090, to reserve your space today.

COMPUTERWORLD
DIRECT RESPONSE CARDS

Systems managers crucial in computer crime prosecution

Editor's note: Legal Eye is a monthly series exploring legal issues in the computer industry.

BY LOU OLENICK
SPECIAL TO CW

If you were to witness a crime, you would call the authorities to arrest the criminal. But with computer break-ins, a different scenario unfolds.

Computer crime falls into a gray area because witnesses are scarce. And unfortunately, break-ins are usually detected well after the fact. Sometimes discovery is accidental; in other situations, systems administrators or auditors notice subtle changes in accounting usage records. Whatever the case may be, information systems managers are key to apprehension, prosecution and civil damage recovery of computer break-ins.

Recent stories of computer crime illustrate the vulnerability of computer systems to fraud, data leaks and tampering. Consider the Californian who used a $200 home computer to break into Citibank NA's New York credit accounts to buy $11,000 worth of mail-order goods; the New Yorker who broke into Grumman Aircraft Systems Division computer systems and copied government files to his home personal computer for a month before getting caught; or the Oklahoma travel agent who altered the American Airlines Frequent Flyer database to receive free flights based on unused frequent flyer points he then resold to unsuspecting customers.

Each of these break-ins is prosecutable because it is defined by federal or state laws: computer activity that causes damage across state lines; the unauthorized use of U.S. government data, equipment or facilities; or activity that threatens the security or commerce of the U.S.

In addition, IS managers should be aware that each state has its own laws to govern computer crime. New York law, for example, requires that all elements of the following list be satisfied before computer tampering is prosecutable: that a person uses a computer or computer service; that a person uses a computer or computer service without the right to do so; that a person intentionally alters data or programs.

IS managers who suspect employees of computer crimes and wish to prosecute can take some of the following steps:

• **Build a case.** Once IS managers are confident that a break-in has occurred, they should bring it to the attention of upper management. Then, the company would be wise to form a team ideally made up of a lawyer and an investigator who both have experience in prosecuting cases in this area. As extravagant as this approach may seem, companies will go to these lengths if the stakes are high enough.

If the firm decides to prosecute the suspect, the IS manager will have to install the necessary tools and procedures to prove that a crime has been committed — before the event. Audit trails of callback procedures, telephone records or reports of account use by access-identification must be preserved.

• **Produce solid evidence.** To search an employee's home or car, an affidavit is required showing probable cause before the judge will allow a search.

For example, the audit trail tracing unauthorized accesses from a phone at a suspect's residence may be necessary before a court-ordered search is allowed. In addition, before police can search, they, too, require probable cause. Without it, they may not conduct searches of an individual, and any evidence they collect illegally is not admissible in court.

• **Enlist the help of experts.** Poorly prepared cases will not make it to court, so use experts to help fill in any gaps. If any element of the law is missing, the prosecutor may refuse to file a complaint.

Experts can strengthen the company's case through their testimony. For example, an ex-employee of the Federal Reserve System broke into the computer to get economic data that allowed him to anticipate the Federal Reserve's interest rate announcements. The expert presented evidence of the Federal Reserve's dial-and-answer-back software, which provided a detailed log of phone calls and led to the tamperer's conviction.

• **Prevent computer access.** If there is concern that an accused employee (or former employee) may break into the system during the several months that the case is prepared for trial, a temporary restraining order should be obtained. If the suspect violates this order, he or she can be sent to jail for contempt of court.

• **Handle termination issues sensitively.** Once an employee is suspected of a computer crime, most companies' policies require termination. This duty falls on the systems manager or the end-user department. The manager should take care to conduct termination and exit interviews according to company policy. To avoid any clashes, a wise manager will have a second person witness the firing. In addition, managers must minimize their company's risk from false arrest. Companies may have to defend themselves against lawsuits for ruining a reputation or for wrongful firing.

Because of all the difficulty and pain associated with prosecution, companies should take steps to avoid the problem in the first place. The most effective measure is to conduct a thorough review of installation security procedures and then take deliberate steps to eliminate the areas of greatest risk.

Olenick is a partner in the New York law firm Olenick and Yarnell, which practices extensively in computer law, commercial transactions and taxation.

Buy/Sell/Lease

COMPUTER ROOM EQUIPMENT
LIEBERT
Computer Room Air Conditioners
3 thru 22 Ton Units
Main Frame Chillers
3 thru 12 Ton Units
Power Distribution Units
30 thru 225 KVA
PILLER
40 & 75 KVA Silentblocks
LIEBERT, EXIDE, EMERSON EPE & IPM
18.75 - 556 KVA UPS Systems
RAISED ACCESS FLOORING
Thousands of square feet in stock, wood and steel.
All items listed are reconditioned with warranty
dp support
DP SUPPORT
P.O. Box 1409
Plano, TX 75086
214-422-4551
214/578-1236 Fax

COMPUTERWORLD
CLASSIFIED MARKETPLACE
Examines the issues while computer professionals examine your message. Call for all the details.
(800)343-6474
(In MA., 508/879-0700)

ICE-LTD. INTERNATIONAL COMPUTER EXCHANGE LTD.
BUY • SELL • LEASE • NEW • USED
PERIPHERALS • SYSTEMS • UPGRADES
1-800-ICE-BUYS
digital
Data General
sun
apollo
IBM PC/AT/PS2
VAX Station 3100 NEW.....$14,000
IBM NEW 6450604 2MB Mem $350
VT 420..NEW..$495 VT 320..NEW..$420 VT 220..USED..$225
IBM NEW 6450876 80486 Upgrade $1,995
Apollo ... DN2500 NEW Loaded $7,500
IBM NEW 34F2933 4MB Mem. ... $850
HP 4MB Mem. .... P/N 98267-A $900
INTELL .. 82380-20 INTELL.. 80486-25
CALL TODAY FOR QUOTE
1-800-ICE-BUYS
INTERNATIONAL COMPUTER EXCHANGE, LTD.
TEL.: (817) 585-8688 • FAX: (617) 585-9177
• 163 MAIN ST. • KINGSTON, MA 02364 •

VAX RENTALS
MV 3600
MV 3800/3900
VAX 6000 SERIES
VAX 8000 SERIES
Systems & Peripherals
• Fast Turnaround • Dependable Products
• Upgrade/Add-On Flexibility
• 6 Months • 12 Months • 24 Months
BROOKVALE ASSOCIATES
EAST COAST (516) 273-7777
WEST COAST (206) 392-9878

The BoCoEx index on used computers

Closing prices report for the week ending November 9, 1990

	Closing price	Recent high	Recent low
IBM PC Model 176	$375	$450	$200
XT Model 086	$500	$550	$450
XT Model 089	$550	$625	$400
AT Model 099	$650	$975	$500
AT Model 239	$875	$1,025	$750
AT Model 339	$925	$1,100	$900
PS/2 Model 30-286	$1,250	$1,300	$1,125
PS/2 Model 60	$1,500	$1,800	$1,400
PS/2 Model 70P	$3,425	$3,450	$3,175
Compaq Portable II	$900	$1,050	$875
Portable 286	$1,275	$1,450	$1,100
SLT 286	$2,500	$2,625	$2,000
Portable 386	$2,600	$2,800	$2,500
LTE 286	$2,000	$2,100	$1,850
Deskpro 286	$1,175	$1,400	$1,100
Deskpro 386/20	$2,900	$3,100	$2,400
Apple Macintosh Plus	$750	$975	$700
SE	$1,150	$1,450	$1,100
II	$3,100	$3,400	$3,050
IIFX	$6,600	$7,100	$6,500

INFORMATION PROVIDED BY THE BOSTON COMPUTER EXCHANGE CORP.

HONEYWELL
LEVEL 6 DPS 6
SERIES 16

- Complete Minicomputer Line -- New & Used
- All Peripherals & Terminals
- Upgrades and Features
- Depot Repair Capability
- Honeywell Maintenance Guaranteed
- Immediate Delivery Low Prices
- HDS 5 and HDS 7 Compatible Terminals

The Recognized Leader in Honeywell Minicomputer Sales and Support

BCS
BOUDREAU COMPUTER SERVICES
100 Bearfoot Road
Northboro, MA 01532
(508) 393-6839
FAX 508-393-3781
"Since 1974"

MAI BasicFour
MPx 9410

Sale or Lease
Call 617-267-8600

COMPUTERWORLD
Classified Marketplace

showcases your ad by product category!

Whether it's used equipment, software, time, services or just about any other category of computer product or service, *Computerworld's* Classified Marketplace is organized to make your ad visible and to make buying your product easy.

Just look!

Computerworld's Classified Marketplace Product Categories

software
hardware
conversions
PC products
time/services
buy/sell/lease
communications
bids/proposals/ real estate
graphics/desktop publishing
peripherals/supplies
business opportunities

So if you're selling computer products or services, advertise in the newspaper that showcases YOUR product or service. Advertise in *Computerworld's* Classified Marketplace!

For more information, call

800/343-6474
(in MA, 508/879-0700)

WE BOUGHT
IBM®

By the thousands.

As a result of our thousands of purchases of new and used IBM systems of all sizes, shapes and descriptions, we are offering you **great savings** on IBM AS/400's, 36's, tapes, drives, printers and peripherals, as well as **all upgrades**.

As a specialty, we offer **multiplexors, modems, protocol converters** and **PS/2's**..

If you have a need to buy or sell, call us first and **DEAL DIRECT** with the...

COMPUTER™ MARKETPLACE

800-858-1144

In CA, dial (714) 735-2102, 205 East 5th Street, Corona, CA 91719

IBM IS A REGISTERED TRADEMARK OF INTERNATIONAL BUSINESS MACHINES, INC

HEWLETT PACKARD
1000 • 3000 9000

Computers
Peripherals
Terminals

Buy • Sell
Rent • Lease

EURODATA INC.
2574 Sheffield Road
Ottawa, Canada K1B 3V7
613-745-0921
FAX: 613-745-1172

PRIME
EXPERIENCED SYSTEMS AND PERIPHERALS

BUY-SELL-LEASE BROKERAGE

NEW PLUG-COMPATIBLE DISK, TAPE, MEMORY

PLUS
THE FASTEST I/O AVAILABLE ANYWHERE

1ST SOLUTIONS, INC.
11460 N CAVE CREEK RD
PHOENIX, AZ 85020
ASK FOR DON SHIFRIS
602-997-0997
Fax: 602-997-1688

CDLA Member Computer Dealers & Lessors Association

GTEX FINANCIAL GROUP, Inc.

IBM
BUY SELL LEASE

PS/2 OPERATING LEASES

3084 3090 PERIPHERALS

OEM/PCM LEASES

800-888-7568
FAX 214/783-1379

Member CDLA — EST. 1978

New/Reconditioned
digital
Equipment

Whatever your requirements are for Digital Equipment, call CSI *first!* Buying, selling, trading, leasing, consignments - we do it all!

CSI sells all equipment with a 30 day unconditional guarantee on parts and labor and is ***eligible for DEC maintenance.***

Offering systems, disk drives, tape drives, printers, terminals, memory, options, boards, upgrades and many more.

CSI Compurex Systems, Inc.
83 Eastman St.
Easton, MA 02334
Call Toll-Free
1-800-426-5499
In Mass. (508) 230-3700
FAX (508) 238-8250

Buying Selling
DEC - SUN Data General Plus All Peripherals

Call DCC
617-837-7255
or
301-750-7200

FOR SALE
FPS Computing System Model 64/164

Will configure with Disk, Memory & Max. Boards to meet your needs. Other FPS Computing Systems available

International Computing Systems
800-522-4272
Fax: 612-935-2580

CLASSIFIED MARKETPLACE
Where Computer Professionals Shop

(800) 343-6474
(in MA; 508/879-0700)

RENT *RIGHT FROM THE SOURCE.*
High-quality datacomm products from Codex

In-stock products shipped within 24 hours!

Modems — V.32, dial, leased line
Multiplexers
DSUs/CSUs
And much more

Why hesitate?
Call us for a quote
800-446-6336.
Fax: 508-261-7105

- Rent direct from Codex and you'll have valuable equity later if you choose to purchase
- All of the versatility, quality and reliability you've come to expect from today's leading datacomm supplier
- Full Codex warranty and nationwide service - installation also available
- Flexible payment options - check, charge, P.O., or C. O. D.

CODEX EXPRESS

CALL 1-800 345-9370

9370
IN-HOUSE TECHNICIANS
Buy
Sell
Lease
SSi
simon systems Inc.

SPECTRA
EQUIPMENT CORPORATION

(714) 970-7000 (800) 745-1233 (714) 970-7095 FAX

BUY SELL RENT LEASE

IBM digital XEROX

ANAHEIM CORPORATE CENTER
5101 E. La Palma Ave.
Suite 206
Anaheim
California 92807
LOS ANGELES
SAN JOSE
SEATTLE

IBM	digital	XEROX
9370, 4381	MicroVax	2700
AS400, S/36,S/38	VAX 6000	3700
Point of Sale	VAX 8000	4050
CAD/CAM	*PROCESSORS*	4090
Series/1	*PERIPHERALS*	8790
Banking	*UPGRADES*	9790

Integrity . . . the Spectra difference!
A full line IBM and Digital computer dealer

WANG
Buy-Sell or Trade
VS PC OIS

Systems in Inventory
VS 7000 / 100 / 85 / 65 / 6 / 5

And Peripherals
4230A • 4230 • Laser Printers
PC/386sx Workstations

Genesis Equipment Marketing
Phone (602) 948-2720 Fax (602) 948-0615

9370's
That's All We Do!

From 20's to 90's
Most Machines, Peripherals & Features
IN STOCK

Call us for a quote
708-831-1255
Executive Infosource
1530 Eastwood Ave., # 100
Highland Park, IL 60035
CDLA

PIZARRO COMPUTER MARKETING INC

Buying used IBM equipment:
- 3380 - Disk
- 3480 - Tape
- 3880-X23 - Cache Controllers (any model)
- 3990 - Controllers

••• Eligible for IBM M/A

Call Chris Bratun
(216) 892-3990
END-USERS ONLY

CALL US LAST
GET YOUR BEST PRICE THEN CALL
COMPUTER BROKERS, INC.

WE
Buy - Sell - Lease
New and Used IBM Equipment
AS400 - System 36, 38, 43XX

SHORT TERM RENTALS

Call 800-238-6405
IN TN 901-372-2622
ASCD MEMBER AMERICAN SOCIETY OF COMPUTER DEALERS

COMPUTER BROKERS, INC.
2978 Shelby St., Memphis, TN 38134
"Since 1974"

CB CB CB CB CB CB CB CB CB CB CB CB CB CB

Save 50%
REFURBISHED
WANG

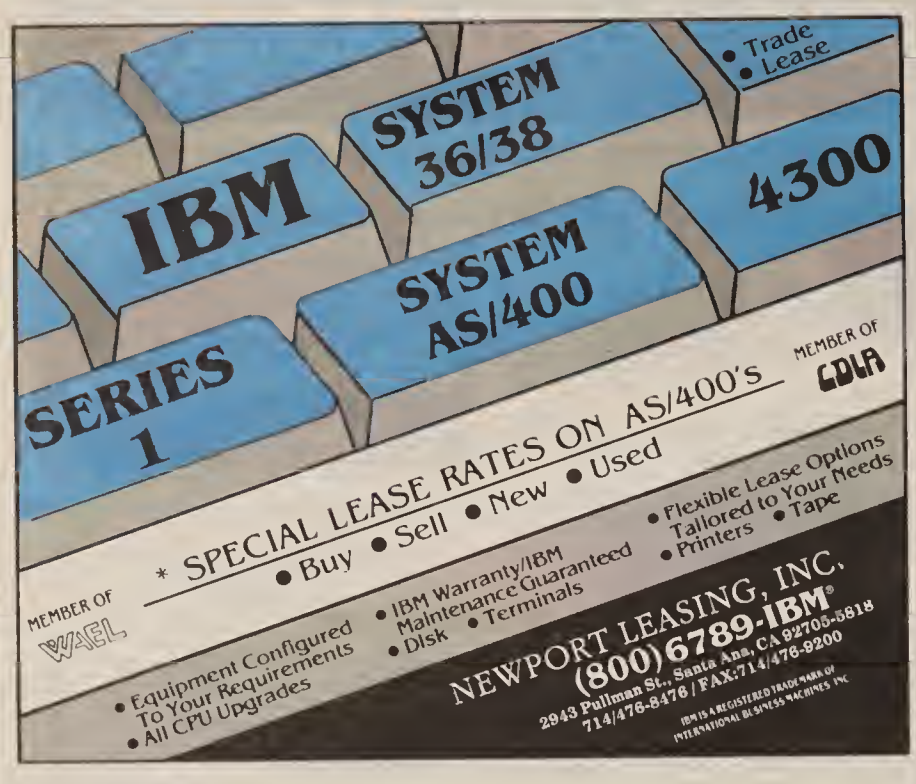
VS • OIS • PERIPHERALS
PCs AND LASER PRINTERS

- Disk Drives, Memory Upgrades, Peripherals and Wang-compatibles
- All equipment guaranteed acceptable for Wang or third-party maintenance.

In Stock for Immediate Delivery Buy, rent or lease
New Wang PCs* at exceptional savings.

wpb
Authorized Wang PC Dealer 1-800-223-9264
Office Automation Experts Since 1978 *New Wang PCs sold in Wang's Eastern Zone and Southern California only

Buy/Sell/Lease



IBM BUY · SELL · LEASE

Member Computer Dealers & Lessors Association CDLA

9370 4381 · SYSTEM 36/38 · AS/400 · SERIES 1 · POINT OF SALE

• Processors
• Peripherals
• Upgrades

DEMPSEY & ASSOCIATES, INC.

18377 Beach Blvd., Suite 323
Huntington Beach, CA 92648 (714) 847-8486

(800) 888-2000

Buy RT RS/6000 SERIES/1 3X,AS/400 937X 4300 Sell Lease Rent

Currently replacing Series/1's with the new RS/6000 line via EDX to AIX migration

612·942-9830

DATATREND, Inc.
10250 Valley View Road
Suite 149
Eden Prairie, Minnesota 55344

IBM SPECIALISTS

SELL • LEASE • BUY
S/34 S/36 S/38 AS/400
3741 3742

- New and Used
- IBM Maintenance Guaranteed
- All Peripherals
- Immediate Delivery
- Upgrades and Features
- Completely Refurbished

800-251-2670
IN TENNESSEE (615) 847 4031

CMA COMPUTER MARKETING of America, Inc.

PO BOX 17 • 610 BRYAN ST. • OLD HICKORY, TN 37138

Associates inc

- Data General
- Fujitsu
- Data Products
- CDC
- Printronix
- Zetaco

BUY SELL TRADE

617/982-9664
FAX: 617/871-4456

DATA CENTER ENVIRONMENTALS

U.P.S. - EXIDE, EMERSON, E.P.E., IPM, DELTEC, PILLAR
A/C - LIEBERT, DATA AIRE, AIRFLOW
D/G SETS - CAT, ONAN, KOHLER
FLOORING - TATE, C-TEC, BESCO

Used/Refurbished · Warranties/Recertification

BUY / SELL / BROKER

Computer Site Technologies, Inc.

262 S. Military Trail • Deerfield Beach, FL 33442
1-800-226-0784

HP HP HP HP

NEW and USED
1000 • 3000 • 9000
Including Spectrum

BUY • SELL • TRADE • RENT • LEASE
Processors • Peripherals • Systems

All in Stock - Immediate Delivery
All warranted to qualify for manufacturer's maintenance

ConAm Corporation
It's Performance That Counts!
800/643-4954 213/829-2277
FAX 213/829-9607

Bids/Proposals/Real Estate

MISSISSIPPI CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received by the CDPA, 301 N. Lamar St., 301 Building, Suite 508, Jackson, MS 39201 for the following equipment and services:

RFP No. 1885, due Thursday, December 13, 1990 at 3:30 p.m. for the acquisition of a 20-workstation microcomputer lab with printers and software for HINDS COMMUNITY COLLEGE, Rankin Branch.

RFP No. 1894, due Thursday, December 6, 1990 at 3:30 p.m. for the acquisition of fifteen (15) 80386SX-based microcomputers, seven (7) dot matrix printers, one (1) laser printer, and one (1) scanner for ITAWAMBA COMMUNITY COLLEGE.

RFP No. 1895, due Friday, December 7, 1990 at 3:30 p.m. for the acquisition of an additional software module for the upgrade of the existing Emergency Information System data management package for the MISSISSIPPI EMERGENCY MANAGEMENT AGENCY.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

Patsy Stanley @ (601) 359-2604

It's the ***Classified Marketplace***

Reach Computer Professionals Where They Shop For:

- ☐ Buy/Sell/Lease
- ☐ Hardware
- ☐ Software
- ☐ Peripherals/Supplies
- ☐ Communications
- ☐ Graphics/Desktop Publishing
- ☐ Time/Services
- ☐ Bids/Proposals/ Real Estate
- ☐ Business Opportunity

CALL NOW

800 343-6474
(in MA., 508/879-0700)

Software

KeyEntry III

PC-BASED DATA INPUT SOFTWARE

REPLACE DEDICATED DATA ENTRY SYSTEMS FRONT-END MAINFRAME APPLICATIONS

- ❑ LAN or stand-alone environments
- ❑ Two-pass verification
- ❑ Batch balancing and check digits
- ❑ Operator statistics reporting
- ❑ Embedded-numeric keypad emulation
- ❑ Extensive field edits and table lookups
- ❑ Screen Painter and MenuManager included
- ❑ Batch Control System and Reformat utility
- ❑ User-definable help screens and windows
- ❑ OS/2 version
- ❑ Outstanding customer support
- ❑ Thousands of users worldwide
- ❑ French, Spanish, and German versions
- ❑ Consulting, conversion and integration services

FREE evaluation systems available for qualified companies.

1-800-533-6879

SOUTHERN COMPUTER SYSTEMS, INC.
2732 Seventh Avenue South • Birmingham, Al 35233
PHONE (205)251-2985 • FAX (205)322-4851

Conversions

Automated Conversions to AS/400

from

1. IBM MAINFRAMES. CICS & Batch COBOL. Up to 65% cheaper/75% quicker than manual conversion. Industry proven.
2. NON-IBM Wang, Unisys, Honeywell, etc.
3. PAPER DOCUMENTS Imaging Systems on PCs and/or AS/400. Call for details.

CSI Inc.
150 Lafayette Street, Suite 800, NYC, NY 10013
Phone: (212) 431 4084 • Fax: (212) 431 4109

Peripherals/Supplies

9-Track Tape For Your IBM PC/XT/AT/PS-2™

Read 1600 or 6250 bpi 9-track tapes from a micro, mini or mainframe in EBCDIC or ASCII as mirror image or by individual files.

Use the 2000 PC™ for disk backup, data interchange or archival storage.

PC/XT/AT/PS-2 are trademarks of IBM.

First In Value

DIGI-DATA CORPORATION
8580 Dorsey Run Road
Jessup, MD 20794-9990
(800) 782-6395
FAX (301) 498-0771

Go Shopping in... Computerworld's
CLASSIFIED MARKETPLACE
Call for all the details
(800) 343-6474
(In MA., (508) 879-0700)

MASS STORAGE?

VHS-Based system holds 10.4 gigabytes/cassette transfers data up to 7.2 gb/hr., file searches in under 90 seconds, integrates with robotics holding up to 600 cassettes (6.24 "near line" TERABYTES) interfaces to ALL computers & networks, under 2 minutes access to any file in 6 to 9 terabytes!

C-R ASSOCIATES, INC.

TEL: 508-372-8536
FAX: 508-521-1418

COMPUTERWORLD
Classified Marketplace
gives you buyers with extensive purchase influence.

In fact, a full 95% are involved in purchase decision making for their organizations. They determine needs, evaluate technologies, identify solutions, and select products and vendors for the entire range of information systems, as well as related products and services.

So if you're selling computer products and services, advertise in the newspaper that delivers buyers with volume purchasing influence. Advertise in Computerworld's Classified Marketplace!

For more information, call
(800) 343-6474
(in MA, 508/879-0700).

ANOTHER REASON WHY COMPUTERWORLD'S MARKETPLACE PAGES WORK ...

Computerworld is the only computer publication to give readers an established classified advertising resource for over two decades! And since Computerworld has been the weekly computer newspaper of choice since 1967 - that means Computerworld's loyal readers will expect to see your classified message in Computerworld's Marketplace Pages!

To place your ad, call John Corrigan, Vice President/Classified Advertising, at **800/343-6474 (in MA, 508/879-0700).**

COMPUTERWORLD
Where all computer buyers and sellers go to market.

Time/Services

Quality Outsourcing

- IBM Mainframe/Peripherals
- Full Technical Support
- 24 hour Help Desk w/ 800#
- Database Specialists
- Consulting Services
- Network Specialists
- Capacity Planning
- Automated Operations

Resources Available Include:

MVS/XA, VM/XA, CMS, CICS, DB2/QMF, TSO/E, ISPF/PDF, SAS, Librarian, IBM IN, PANVALET, EASYTREIVE, Telenet/Tymnet, TOP SECRET

ITAC **Call: (201) 216-3216**
INFORMATION TECHNOLOGY ALLIANCE CORPORATION

MCN Computer Services

is your link to perfection.

State-of-the-art IBM compatibility:

MVS-ESA * VM/XA * TSO/E * ROSCOE * CICS * IMS * IDMS/R * DB2 * QMF * PROFS *

Programmer productivity aids:

FILE-AID * CICS PLAYBACK * dBUG-AID * ABEND-AID * CICS ABEND-AID *
(Preceeding products are registered trademarks of Compuware Corporation)

MCN Computer Services provides outsourcing solutions to major international clients. With one of the country's finest computer facilities, your data is secure, yet readily available. High-quality, cost-effective services include:

- Remote computing
- Computer outsourcing
- Facility management

MCN Computer Services, Inc.

For more information, call Lisa Walker at:
1-800-521-0444

5225 Auto Club Drive
Dearborn, Michigan 48126

REMOTE COMPUTING

- We locate COMPUTER TIMESHARING, including OUTSOURCING on ALL mainframes.
- Since 1968 we have found your LOWEST prices from over 800 nationwide data centers.
- NEVER a charge to the Buyer, because our fee is paid by the Seller.

CALL DON SEIDEN AT

COMPUTER RESERVES, INC.

(201) 882-9700

COST-EFFECTIVE COMPUTING SERVICES for TODAY and.... TOMORROW

COMDISCO COMPUTING SERVICES CORP.

Provides you with:

REMOTE COMPUTING
COMPUTER OUTSOURCING
FACILITY MANAGEMENT

Featuring:

- **IBM® CPUs and Peripherals**
- **Systems Software: MVS/XA, TSO/E, ISPF/PDF, CICS, VM/XA, VM/SP, HPO, CMS**
- **Application Software: Database Management Application Development 4/GLs Graphics Statistical Analysis**
- **Multiple Communications Methods**
- **Technical Support**
- **Automated Tape Handling**
- **ULTRA-Secure Data Center**
- **Advanced Laser Printing**
- **Pricing to fit your needs**

Call: Robert Marino
201-896-3011

COMDISCO

COMDISCO COMPUTING SERVICES CORP.
430 Gotham Parkway, Carlstadt, NJ 07072

Financial Technologies

Innovative, Responsive, Quality

a few words that describe the most complete computer processor

offering.....

IBM 3090, MVS/XA, MSA, DB2, VM/HPO, TSO, CICS/VSAM and a multitude of third party software

the complete source for ... outsourcing ...

1-800-443-8797

14300 Sullyfield Circle
Chantilly, Virginia 22021

QUALITY COMPUTING SERVICES

PROCESSING & SYSTEMS OPERATIONS
OUTSOURCING
FACILITIES MANAGEMENT
REMOTE COMPUTING / TIMESHARE

SYSTEMS PLANNING & CONSULTING
STRATEGIC SYSTEMS PLANNING
NEEDS ANALYSIS / FEASIBILITY
QUALITY ASSURANCE PROGRAMS

PROJECT MANAGEMENT
PROJECT LEAD / CONSULTANT SUPPORT
SYSTEMS DEVELOPMENT
SYSTEM / DATA CONVERSIONS

For more information contact Susan Boush at: (206) 924-2527 or (800) 654-9347

Weyerhaeuser Information Systems

Your used computer equipment deserves a second chance.

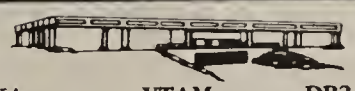
If you have used computer equipment to sell, *Computerworld's* Classified Marketplace is the best place to do your selling. That's because the Classified Marketplace features a Buy/Sell/Lease section to help you market your equipment to the very people who are looking to buy.

And when you advertise in *Computerworld* Classified Marketplace, you reach a total (ABC-audited) audience of over 612,000 computer professionals who turn to *Computerworld* for news, information, features - and the Classified Marketplace - every week.

So give your used computer equipment a second chance today. To reserve your space, call:

800/343-6474
(in MA, 508/879-0700)

ICOTECH



MVS/XA	VTAM	DB2
TSO/ISPF/SDSF	FILE-AID	SIMWARE
CICS	INTERTEST	ACF2
ADABAS	SAS	ADC2
LIBRARIAN	$AVRS	

- 24 hour availability
- International access
- Superior technical support staff
- Uninterrupted Power Supply
- Certified on-site vault
- Disaster recovery
- Impeccable service

Call Now - Solve Your Computing Worries TODAY & TOMORROW!

(201) 685-3400

OUTSOURCING AND REMOTE COMPUTING

- IBM MVS/XA Environment
- DB2, IDMS/R, Model 204 and 4GLs
- Professional Support Staff
- Experienced Migration Management Team
- Simplified Pricing and Invoicing
- AS/400
- Full Supporting Services
  - Media Conversion
  - Laser & Impact Print Facility
  - Application Programming
- Technical Support
- 24 Hours a Day – 7 Days a Week

May & Speh, inc.

1501 Opus Place, Downers Grove, IL 60515-5713
1(800) 729-1501
For More Information Contact: Tony Ranieri

REMOTE COMPUTING OUTSOURCING

- MVS/XA
- CICS
- DB2
- VM/370
- TSO
- IMS/DBDC
- DOS/VSE
- CMS

OVER 150 SOFTWARE PRODUCTS

- DEVELOPMENT
- PRODUCTIVITY
- DEBUGGING
- PERFORMANCE

- TELENET
- SEARSNET
- TYMNET
- IBM INFORMATION NETWORK

EXTRAORDINARY CUSTOMER SERVICE
MIGRATION MANAGEMENT

GIS INFORMATION SYSTEMS, INC
815 Commerce Drive, Oak Brook, IL 60521

708-574-3636 New England 617-595-8000

ON-LINE WITH COMPUSOURCE

- Multiple centers
- RACF, CICS, IMS
- Volume & term discounts
- Full technical support
- Disaster recovery services
- MVS/XA, VM, DOS
- SAS, DB2
- Worldwide access
- Laser printing

COMPUSOURCE
(919) 469-3325

Softening 'manual' labor

IS trainers can add zip to custom-developed documentation

BY JON WILLIAM TOIGO
SPECIAL TO CW

Have you ever sat through a five-hour lecture on Cobol compilers, slept on a bed of nails or assembled a Nintendo set without directions? If you answered yes to all of these questions, then you know what it's like to read custom-developed hardware and software manuals. Boring, painful, impossible.

This documentation, mainly developed by programmers and analysts, often depicts system use from the point of view of the data technician rather than the user. What results is a document that describes the system rather than a manual that explains its use.

Of course, to insist that all programmers develop effective end-user documentation writing skills or become better communicators by developing an awareness and appreciation of the principles of adult education is an anathema — like asking a SWAT team to sit for a class in sensitivity training.

Power of the pen

One logical solution, then, is to put the power of the documentation pen into the hands of a group accustomed to teaching: your information systems training department.

The same methods trainers bring to course development materials may be useful in end-user documentation development as well: text handouts, presentation graphics, computer-based training (CBT) and animated demonstrations and even videotape programs. The IS trainer can then shape the presentation based on the principles of how adults learn and a knowledge of the population being trained.

While IS trainers may certainly lack the technical knowledge of programmers and systems analysts, they are generally accomplished researchers. For high-level systems documentation, such as data flowcharts or entity-relationship models, the trainer can consult with the systems experts to develop a firm grasp of the new application.

After consulting with the systems specialists, the IS trainer can then translate that information into terms that the user would need in order to perform a certain function on a system that is unfamiliar to them. Whatever is too complicated for a trainer to comprehend probably does not belong in an end-user manual in the first place.

As a safeguard against content errors, at least one technical expert should participate in a review of lessons and documentation drafts before they are presented to end users.

By assigning the responsibility for end-user documentation to corporate trainers, several efficiencies can be achieved:

• **Straightforward presentation.** Training course developers are attuned to the learning needs of their trainees and possess some insight into how text should be organized for ease of understanding. Instead of creating a reference manual that must be absorbed by users through osmosis before they can begin to use a system, the wise trainer will likely organize information by task.

Average users don't particularly care about the wondrous programming achievements embodied in the applications they must use. They only want to know what steps to take or which keys to press to accomplish specific tasks and log out of the system as quickly as possible. This is an attitude to which IS trainers have always catered: Keep it simple, and tell the trainees only what they need to know. The rest is superfluous.

• **Learning stimulation.** In line with the principles of adult education, IS trainers always attempt to stimulate as many trainee senses as possible to achieve the most effective levels of communication and information retention. The visual sense is primary among these learning senses.

In text treatments, CBT, animated demonstrations and video, the object is to teach with pictures and support the pictures with words.

Given responsibility for user-manual development, training developers can integrate pictures into text matter via desktop publishing to produce texts that are visually attractive as well as informational.

As an added advantage, graphics created for the user manual can be readily converted to new formats and reused in classroom or self-study training materials and multimedia.

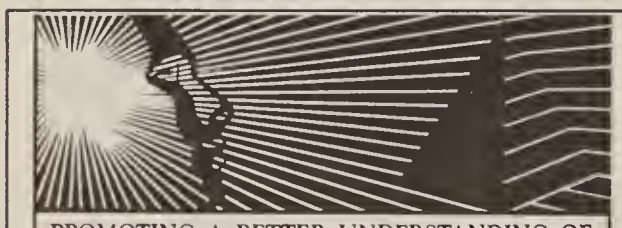
• **Potential cost savings.** Technical professionals are typically paid more than training developers. Thus, giving end-user documentation responsibilities to IS training personnel is actually more cost-effective than having technical professionals perform the work. Even if training professionals are paid on a par with technical professionals, the company will save money. Why? Assuming that the trainers will do a better job, user productivity and system acceptance will be much higher.

Bottom line

Delegating user documentation development to the corporate training organization is both cost-effective and training-effective. The training organization can streamline the training development process if they have already created and illustrated user documentation. For a fairly straightforward system, the user manual may be all of the training that is required.

However, for companies that do not have a formalized training function, the lessons of effective user manual development need not be lost. The next time a systems professional is asked to develop a user manual, he should guide the effort with a simple question: What are the five or 10 or 20 tasks that a user is going to perform most often using the system? A simple step-by-step procedure or "cheat sheet" for accomplishing each task is better than 500 pages of eloquently written and overdescribed documentation.

Toigo is a free-lance writer based in Clearwater, Fla., who specializes in business computing topics.



PROMOTING A BETTER UNDERSTANDING OF
INFORMATION ENGINEERING

CEC is pleased to present the current public offerings of our Information Engineering courses.

Course	Date	Location	Price/ Student
IE/Design	Dec. 3-6	Los Angeles	$1195.00

For more information about our offerings, please contact the CEC Education Coordinator at:

(313) 569-0900

cec

"The IE Practitioners"

18620 W. 10 Mile Rd. • Southfield, MI 48075-2667

IBM* INSTRUCTOR-LED MAINFRAME TRAINING
AT YOUR SITE
CALL 800-252-6696
FOR OUR CATALOG OF OVER 80 COURSES

"C"
ASM
COBOL
CICS VSAM
DB2 SQL ORACLE
APPLICATION SYSTEM
DATA COMMUNICATIONS

THE KNOWLEDGE EXCHANGE, INC.
WE'RE NOT BERLITZ
BUT WE SPEAK ALL LANGUAGES
*IBM IS A REGISTERED TRADEMARK OF THE INTERNATIONAL BUSINESS MACHINES CORPORATION

PRACTICAL GUIDE TO LAN PLANNING & INSTALLATION
$149.00

PRACTICAL GUIDE TO LAN SYSTEMS ADMINISTRATION
$99.00

Take Both Selections For $199.00

NovaNet, Inc.
8114 Mizner Lane
Boca Raton, FL 33433

Allow 4-6 Weeks For Delivery

Student Signup System

For: Corp.Information Centers/ Training Companies

- PC Lan (Multi-User)
- Student Signups
- Invoicing
- Scheduling
- Management Reporting

Free Demo Disk
Call (919) 460-0071
Computer Decisions
PO Box 80024
Raleigh, NC 27623

COMPUTERWORLD
TRAINING SECTION
Examines the issues while Computer Professionals examine your message. Call for all the details
(800) 343-6474
(in MA., 508/879-0700)

COMPUTERWORLD
Training Pages give you cost-effective reach!

That's because *Computerworld's* training Pages give you the most widespread reach available to management and staff in America's IS departments - the departments that directly control America's IS training dollars.

And for good reason *Computerworld* is the *best read publication* in America's IS departments - the departments that directly control nearly 80% of the $233 billion US market for all ranges of computer software, hardware, data communications equipment, services and staff.

What's more *Computerworld's* Training Pages lead buyers to your ad with a weekly Training editorial feature that anchors the section and your ad. Whether it's topics like "Unraveling SQL for MIS pros," or "Finessing the training contract," *Computerworld's* Training Pages deliver pertinent, advice-oriented editorial to *Computerworld's* readers every week.

COMPUTERWORLD
Where all computer buyers and sellers go to market.

"Our advertising in Computerworld's Classified Marketplace more than pays for itself."

— Mark Ostroff
President & Partner
Compurex Systems, Inc.

Headquartered in the Boston area, Compurex Systems is a distributor of new and reconditioned IBM and Digital equipment. With a product line that includes everything from systems and disk drives to printers and other peripherals, it has a lot to offer large end users. President Mark, "Rocky" Ostroff, along with his two partners, Christopher Pernock and Jack Malamut, face the challenge of finding everyone who has something to sell or is looking to buy. When it comes to advertising, they're on the right track.

"We need to get the Compurex name out to a broad base of prospects in a variety of industries. And we need to tell them about all of our programs — buying, selling, trading, leasing, and consignments. We believe that most people who buy/sell concentrate on the classified section. It's where they look first. For us, Computerworld's Classified Marketplace is where our message gets delivered to the largest and most diverse audience of potential customers.

"Since we founded Compurex Systems in 1986, sales have doubled each year. To maintain this momentum, it's critical for us to continue generating quality leads. Our weekly ad in Computerworld's Classified Marketplace keeps a steady stream of calls coming in — even international calls. Based on these results, our advertising in Computerworld's Classified Marketplace more than pays for itself.

"In early 1990 we'll be moving our expanding business to larger quarters — from Stoughton just up the road to Easton. But one thing won't change: our weekly advertising schedule in Computerworld's Classified Marketplace. That's where we'll stay to keep the calls coming in."

Computerworld's Classified Marketplace. It's where computer buyers meet computer sellers. Every week. Sellers and buyers like Compurex Systems who advertise in *Computerworld*'s Classified Marketplace because it reaches over 612,000 information systems professionals. And because it works. To put your classified message into the hands of America's most powerful audience of buyers, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).

COMPUTERWORLD
CLASSIFIED MARKETPLACE

Where all computer buyers and sellers can go to market.

Computerworld is an IDG Communications Newspaper

SALES OFFICES

Publisher/Fritz Landmann

Senior Vice-President/National Sales Director/Kevin Harold, **COMPUTERWORLD**, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 **(508) 879-0700**

BOSTON: Regional Vice-President - North/David Peterson, Sr. District Managers/Bill Cadigan, Sherry Driscoll, District Manager/John Watts, Sales Assistants/Alice Longley, Lisa Bonaccorso, Linda Clinton, **COMPUTERWORLD**, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 **(508) 879-0700**

CHICAGO: Regional Vice-President - Midwest/Kevin McPherson, Senior District Manager/Larry Craven, Sales Assistants/Kathy Sullivant, Karol Lange, **COMPUTERWORLD**, 10400 West Higgins Road, Suite 300, Rosemont, IL 60018 (708) 827-4433

NEW YORK: Regional Vice-President - East/Bernie Hockswender, District Managers/Fred LoSapio, Paula D'Amico, Sales Assistants/Susan Kusnic, Patricia DeBlase, **COMPUTERWORLD**, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090

LOS ANGELES: Regional Vice-President - West/Michela O'Connor Abrams, Southwestern Regional Manager/Fran Cowen. Sales Assistant/Bev Raus, **COMPUTERWORLD**, 18008 Sky Park Circle, Suite 145, Irvine, CA 92714 (714) 261-1230

SAN FRANCISCO: Regional Vice-President - West/Michela O'Connor Abrams, Senior District Manager/Ernie Chamberlain, District Managers/Alicia Saribalis, Michele Gerus, John J. Flood, Sales Assistants/Nurit Zekman, Chris Kobayashi, Carol Lacasse, Lisa Cremarosa **COMPUTERWORLD**, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555

ATLANTA: Regional Vice-President - East/Bernie Hockswender, Sales Assistant/Debra Brown, **COMPUTERWORLD**, 1400 Lake Hearn Drive, Suite 330, Atlanta, GA 30319 (404) 394-075B

DALLAS: Regional Vice-President - Midwest/Kevin McPherson, Southeastern District Manager/Darren Ford, Sales Assistant/Brenda Shipman, **COMPUTERWORLD**, 14651 Dallas Parkway, Suite 304, Dallas, TX 75240 (214) 233-0882

WASHINGTON, D.C.: Regional Vice-President - East/Bernie Hockswender, District Manager/Paula D'Amico, **COMPUTERWORLD**, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 967-1350

CLASSIFIED ADVERTISING SALES:
Vice President/Classified Advertising/John Corrigan, Marketing Director/Derek E. Hulitzky, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474, In MA **(508) 879-0700**

PRODUCT CLASSIFIED ADVERTISING:
East: Account Manager/Paul Bonarrigo, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474, In MA **(508) 879-0700**

West: Account Executive/Bill Creonte, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474, In MA **(508) 879-0700**

RECRUITMENT ADVERTISING SALES OFFICES:
New England: Regional Manager/Nancy Percival, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474, In MA (508) 879-0700, Account Executive/Andrew Rowe, (800) 343-6474, In MA **(508) 879-0700**

Mid-Atlantic: Regional Manager/Valerie Galbo, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 967-1350, Account Executive/Caryn Diott, (800) 343-6474

South-Atlantic: Regional Manager/Katie Kress, B304 Professional Hill Drive, Fairfax, VA 22031 (703) 573-4115, Sr. Account Executive/Pauline Smith (800) 343-6474

Midwest: Regional Manager/Pat Powers, O'Hare Corp. Twr 1, 10400 W. Higgins Rd., Ste. 300, Rosemont, IL 60018 (708) 827-4433, Account Executive/Ellen Casey (800) 343-6474

West: Regional Manager/Barbara Murphy, 18008 Skypark Circle, Ste. 145, Irvine, CA 92714 (714) 250-0164, Account Executive/Christopher Glenn (800) 343-6474

DIRECT RESPONSE CARDS:
East: Account Manager/Norma Tamburrino, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090

West: Account Executive/Jill Halbert, 18008 Skypark Circle, Ste. 145, Irvine, CA 92714 (714) 250-0164

IDG INTERNATIONAL MARKETING SERVICES:
Managing Director/Frank Cutitta, **COMPUTERWORLD**, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 **(508) 879-0700**

West Coast Marketing Manager/Leslie Barner, 3350 West Bayshore Road, Suite 201, Palo Alto, CA 94303 (415) 424-1001

CW PUBLISHING/INC.

An IDG Company: The Worlds Leader in Information Services on Information Technology.

Fritz Landmann
President & Publisher

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171
Phone: 508-879-0700, Telex: 95-1153, FAX: 508-872-8564

Val Landi	Kevin Harold	Matthew Smith
Senior Vice-President	**Senior Vice-President**	**Senior Vice-President**
Special Publications Division	**National Sales Director**	**Chief Financial Officer**

FINANCE **Controller**, Mark Sullivan.
SALES **Advertising Director**, Carolyn Novack. **Vice President Classified Advertising**, John Corrigan.
Marketing Director, Derek E. Hulitzky. **Classified Operations Director**, Cynthia Delany.
Display Advertising Production Manager, Maureen Hanley. **Classified Sales Supervisor**, Jay Novack
MARKETING **Vice President/Business Development**, Jan Harper. **Manager, Marketing Communications**, Mary Doyle.
Account Manager, Marketing Communications, Elizabeth Phillips. **Manager, Trade Show & Conventions**, Audrey Shohan.
CIRCULATION **Director of Circulation Management**, Maureen Burke. **Director of Circulation Promotion**, Carol Spach.
PRODUCTION **Vice President/Manufacturing**, Leigh Horneth. **Director of Publishing Technology**, Carol Polack.
Production Manager, Beverly Wolff.
PUBLISHER'S OFFICE **Assistant to the President**, Karen Elliott.
Assistant to the Senior Vice-President/National Sales Director, Nancy Gibbs.
Assistant to the Senior Vice-President/Special Publication Division, Libby Levinson

GLOBAL LEADERSHIP NETWORK

FOREIGN EDITORIAL/SALES OFFICES

ARGENTINA: Ruben Argento, CW Communicaciones S/A, Av. Belgrano 406-Piso 9, CP 1092 Buenos Aires. Phone: (011) 54 134-5583. Telex: (390) 22644 (BAZAN AR).

ASIA: S.W. Chan, Asia Computerworld Communications Ltd., 701-4 Kam Chung Bldg., 54 Jaffe Road, Wanchai, Hong Kong. Phone: (011) 852 5 861 3238. FAX: (011) 852 5 86 10953.

AUSTRALIA: Alan Power, IDG Communications Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (011) 61 2 4395133. Telex: (790) AA74752 (COMWOR). FAX: (011) 61 2 439 5512.

AUSTRIA: Manfred Weiss, CW Publikationen Verlags Ges.m.b.H., Ziegergasse 6, A-1070 Wien, Austria. Phone: (011) 43 523 16 31 0. Telex: (847) 115542 (SCH/A) FAX: (011) 43 523 05 08 33.

BRAZIL: Ney Kruel, Computerworld do Brazil Ltda, Praca Floriano, 19/26 Andar, 2031 Rio de Janiero, RJ Brazil. Phone: (011) 55 21 240 8225. Telex: (391) 21 30830 BR. **Sao Paulo:** Computerworld do Brazil Ltda., Rua Joaquim Floriano, 488/3 andar-CEP 04534, Sao Paulo, Brazil, Tel: (011) 55 11 852 8536. Telex: (391) 1132017 (WORO BR).

COLOMBIA: Heli Abel Torrado, La Nueva Ley, Computerworld-Columbia, Transv. 23 No. 58-28, Apartodo Aerao 54018, Bogota, D.E. Columbia. Tel: (011) 57 248 9010.

DENMARK: Preben Engell, IDG Danmark A/S, Krujmtappan 4 DK-2500 Valby Denmark. Tel: (011) 45 36 442800, Telex: (855) 31566. FAX: (011) 45 36 442033.

FRANCE: Francois Chaussonniere, IDG Communications S.A., Immeuble La Fayette, 2, Place des Voques, Cedex 65, 92051 Pans la Oefense, France. Tel: (011) 33 1 4904 7900. Telex: (842) 613234F. FAX: (011) 33 1 4904 7800.

HUNGARY: Dezso Futasz, Computerworld Informatika Co., Kft. Pf. 386, 1536 Budapest, Hungary, Phone: (011) 3611 228 458. Telex: (861) 225307 (KSHP H). FAX: (011) 3611 423 965.

INDIA: S.K. Bhayana, Media Transasia India Ltd., 102 Anand Lok, New Delhi 110049, India. Tel: (011) 91 11 644 0110. FAX: (011) 91 11 643 2950.

ITALY: Umberto Costamagna, Computar Publishing Group CPG, Via Viola 1, 20137 Milano, Italy. Phone: (011) 39 2 2613432. Telex: (843) 335318. FAX: (011) 39 2 284 0737.

JAPAN: Jim Povec, IDG Communications/Japan, Kioicho TBR Bldg., 5-7 Kojimachi, Chiyodaku Tokyo 102, Japan. Tel: (011) 81 3 222 6411. Telex: (781) 252 4217. FAX: (011) 81 3 222 6566.

MEXICO: Henry Morales, Computerworld Mexico S.A. de C.V., Oaxaca 21-2, Mexico City 7 O.F. Colonia Roma, 06700 Mexico. Tel: (011) 52 5 514 4218 or 6309. Telex: (383) 177 1300 (ACHAME). FAX: (011) 525 511 4860.

THE NETHERLANDS: Ruud Bakker, IDG Communications B.V., de Paulus Potterstraat 18, 1071 DA Amsterdam, The Netherlands. Tel: (011) 31 20 664 6426/664 5818. Telex: (844) 18242 (CWCOM NL). FAX: (011) 3120 796 006.

NEW ZEALAND: Martin Taylor, IDG Communications Ltd., 2nd Floor, 15 Augustus Terrace, Parnell, Auckland 1, New Zealand. Phone: (011) 64 9 779 902. Fax: (011) 64 9 774 604.

NORWAY: Morten Hansen, CW Norge A/S, Hovinveien 43, 0576, Oslo 5, Norway. Phone: (011) 472 647725. Telex: (856) 76476 (CW NOR N). FAX: (011) 47 268 0152.

PEOPLE'S REPUBLIC OF CHINA: Shen Yao, China Computerworld, 74 Lu Gu Road, Box 750, Beijing 100039, People's Republic of China. Tel: (011) 861 81 0044. Telex: (716) 222214 (CCW CN).

SINGAPORE: Asia Computerworld Communications, 04-07 Parkway Builders Centre, No.1 Marine Parade Central, Singapore 1544, Republic of China. Phone: (011) 65 345 8383. Telex: (786) RS 37003 (Comwor). FAX: (011) 65 345 7097.

SOUTH KOREA: Young-Sil Gimm, HI Tech Information, Inc. 5th floor, Pungchun Building, 45-1 Wohyo-Ro 1 Ga, Youngsan-Gu, Seoul 140-111, Korea. Tel: (011) 82 2 719 8031. FAX: (011) 82 2 713 5971.

SPAIN: Paco Zabala, CW Communications, S.A., Rafael Calvo, 18, 48, 28010 Madrid, Spain. Phone: (011) 34 1 419 4014. Telex: (831) 45522 (CW E). FAX: (011) 34 1 419 6104.

SWEDEN: Bangt Mamfeldt, CW Communications AB, Sodra Hamnvagen 22, S-115 41 Stockholm, Sweden. Tel: (011) 46 8667 9180. Telex: (854) 14904 9 (NOVACW). FAX: (011) 46 8667 8780.

SWITZERLAND: Gebhard Osterwalder, CW Publikationen AG, Witikonerstrasse no. 15, Postfach 253, CH - 8030 Zunch, Switzerland. Phone: (011) 41 1 55 10 77. Telex: (845) 816 710 (CWCI CH). FAX: (011) 41 1 55 1135.

TAIWAN: David Chu, IDG Communications/Taiwan, 4F-2, No. 137, Fu Hsin South Road, Sec. 1 Taipei, Taiwan, Phone: (011) 886 2 776 4553. Telex: (785) 14142 (ACEGROUP). FAX: (011) 886 2 721 6444.

LONDON: Richard Ward, CW Communications Ltd., 99 Grays Inn Rd., London, WCI 8UT, United Kingdom. Phone: (011) 44 71 405 2347. Telex: (851) 262346. FAX: (011) 44 71 405 2347.

UNITED KINGDOM: Colin Smith, Oliver Smith & Partners, 18 Abbeville Mews, 88 Clapham Park Road, London SW4 7BX, United Kingdom. Phone: (011) 44 71 978 1550. FAX: (011) 44 1 978 1550.

VENEZUELA: Kalman von Vajna Nagy, IDG Comunicaciones C.A., Torre Maracaibo, Piso 10, Oficina H, Av. Libertador, Caracas, Venezuela. Phone: (011) 58 2 72 76 30. FAX: (011) 58 2 724970.

WEST GERMANY: Eckhard Utpadel, IDG Communications Verlag AG, Rheinstrassa 26/28, Postfach 40 04 29, 8000 Munich 40, West Germany. Phone: (011) 49 89 360860. Telex: (851) 5215350. (COMW 0). FAX: (011) 49 89 3 60 86257.

INTERNATIONAL DATA GROUP, INC.

Patrick J. McGovern	Axel Leblois	Walter Boyd	William P. Murphy
Board Chairmen	**Vice-Chairmen**	**President**	**Vice President/Finance**

Computerworld is a publication of International Data Group, the world's largest publisher of computer-related information. International Data Group publishes over 130 computer publications in more than 40 countries. Nineteen million people read one or more International Data Group publications each month. International Data Group's publications include: ARGENTINA'S *Computerworld Argentina;* ASIA'S *Asian Computerworld;* AUSTRALIA'S *Computerworld Australia, PC World, Macworld;* AUSTRIA'S *Computerwelt Oesterreich;* BRAZIL'S *DataNews, PC Mundo;* CANADA'S *ComputerData;* CHILE'S *Informatica, Computacion Personal;* COLUMBIA'S *Computerworld Columbia;* DENMARK'S *CAD/CAM WORLD, Computerworld Danmark, PC World, Macworld, Unix World;* FINLAND'S *Mikro PC, Tietovilkko;* FRANCE'S *Le Monde Informatique, Distributique, InfoPC, Telecoms International;* HUNGARY'S *Computerworld SZT, Mikrovilag;* INDIA'S *Computers & Communications;* ISRAEL'S *People & Computers;* ITALY'S *Computerworld Italia, PC World Italia;* JAPAN'S *Computerworld Japan, Infoworld, Publish;* KOREA'S *HI-Tech Information/Computerworld;* MEXICO'S *Computerworld Mexico, PC Journal;* THE NETHERLAND'S *Computerworld Netherlands, PC World, Amiga World;* NEW ZEALAND'S *Computerworld New Zealand, PC World New Zealand;* NIGERIA'S *PC World Africa;* NORWAY'S *Computerworld Norge, PC World Norge CAD/CAM, Macworld Norge;* PEOPLE'S REPUBLIC OF CHINA *China Computerworld, China Computerworld Monthly;* POLAND'S *Computers;* SPAIN'S *CIM World, Communicaciones World, Computerworld Espana, PC World, Amiga World;* SWEDEN'S *Computer Sweden, PC/Nyhetherna, Mikrodatom, PC World, Macworld;* SWITZERLAND'S *Computerworld Schweiz;* TAIWAN'S *Computerworld Taiwan, PC World;* UNITED KINGDOM'S *Graduate Computerworld, PC Business World, ICL Today, Lotus UK, Macworld U.K.;* UNITED STATES' *Amiga World, CID, Computerworld, Digital News, Federal Computer Week, GamePro, InCider, InfoWorld, International Custom Publishing, Macworld, Network World, PC Games, PC World, Portable Computing, PC Resource, Publish!, Run, Sun Tech Journal;* U.S.S.R.'S *PC World U.S.S.R., Manager, PC Express, Network;* VENEZUELA'S *Computerworld Venezuela, Micro Cmputerworld;* WEST GERMANY'S *Computerwoche, Information Management, PC Woche, PC Welt, Amiga Welt, Macweit.*

ADVERTISERS INDEX

Apple Computer 92-93
AT&T 20-21,34-35,37,85-87,121
Avatar Corp 60

Banyan Systems 73
Bell Atlantic 56,65
BMC Software 26
Bull Worldwide Information Systems 74-75
Businessland 89-100

Cambex Corp. 84
Codex 76
Command Technology 47
Compaq Computer Corp. 44-45
Computer Associates 3
CW Circulation 110

Datapreference 12,82,116
DCA 32-33
Dun & Bradstreet 148

Eastman Kodak 114
Epson America 54-55

Hewlett Packard 16-17,78-79

IBM 46,68-69,99,147
Index Technology 15
Infomart 113
Inforum 64
Innovation Data Processing 7
Intel 104-105
IPL Systems 30

Legent 19,24-25

Mansfield Software Group 48
Micro Focus 43
Microsoft 108-109
Motorola 70-71
Multi-Tech Systems 120

NCR 96-97
NEC 50-51
Netec International 40
Network Systems Corp. 88
Novell, Inc. 118-119
Nynex 106-107

On-Line Software 52-53
Oracle 9,13

Progress Software 83

Realia 57

SAS Institute 59
Software 2000 38
Software Engineering of America 11
Sterling Software 42
Syncsort 5

Telebit 62-63
Texas Instruments 28-29

Universal Data Systems 81

Wordperfect 10
Wyse Technology 66

Xerox 115

Zenith Data Systems 39

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Have A Problem With Your Subscription?

We want to solve it to your complete satisfaction, and we want to do it fast. Please write to:

COMPUTERWORLD, P.O. Box 2043, Marion, Ohio 43305-2043.

Your magazine subscription label is a valuable source of information for you and us. You can help us by attaching your magazine label here, or copy your name, address, and coded line as it appears on your label. Send this along with your correspondence.

Address Changes or Other Changes to Your Subscription

All address changes, title changes, etc. should be accompanied by your address label, if possible, or by a copy of the information which appears on the label, including the coded line. Please allow six weeks for processing time.

Your New Address Goes Here

Name
Company
Address
City State Zip

Address shown: ☐ Home ☐ Business

Name Title Company Address City State Zip

Other Questions and Problems

It is better to write us concerning your problem and include the magazine label. Also, address changes are handled more efficiently by mail. However, should you need to reach us quickly the following toll-free number is available:

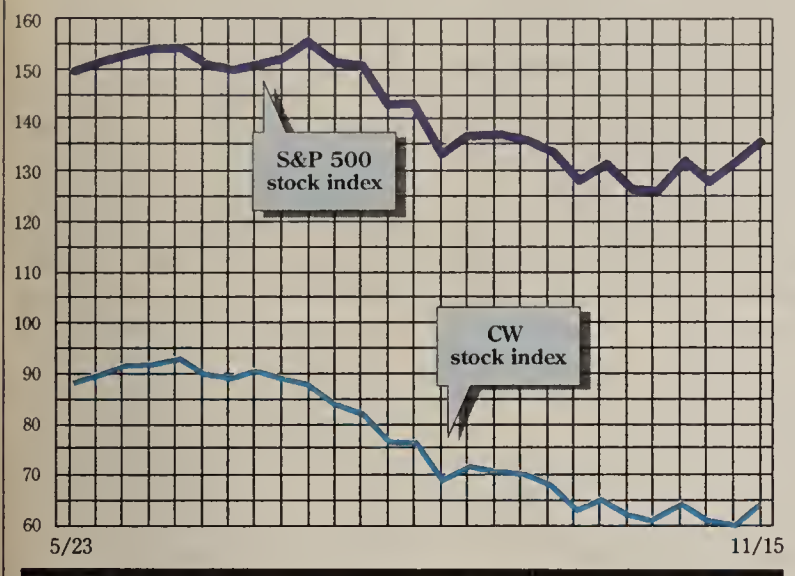
1-800-669-1002

Outside U.S. call: (614) 382-3322

COMPUTERWORLD

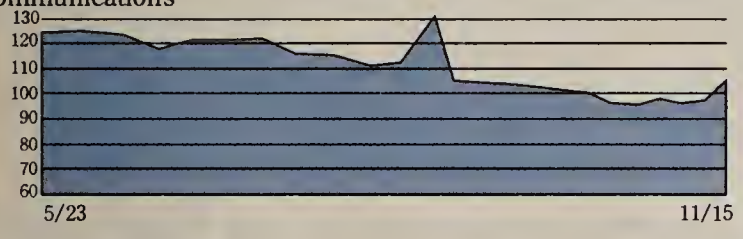
P.O. Box 2043, Marion, Ohio 43305

STOCK TRADING INDEX

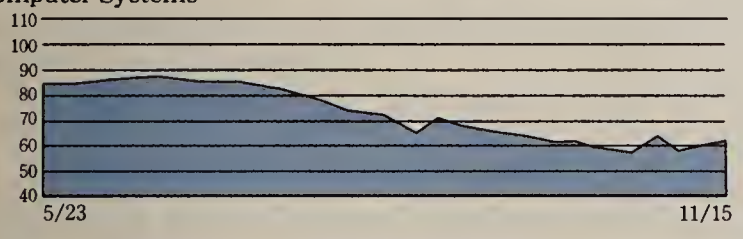


Indexes	*Last Week*	*This Week*
Communications	98.8	**105.3**
Computer Systems	60.3	**63.4**
Software & DP Services	89.0	**94.7**
Semiconductors	36.8	**40.1**
Peripherals & Subsystems	68.2	**70.7**
Leasing Companies	44.7	**47.7**
Composite Index	60.9	**64.7**
S&P 500 Index	131.6	**135.3**

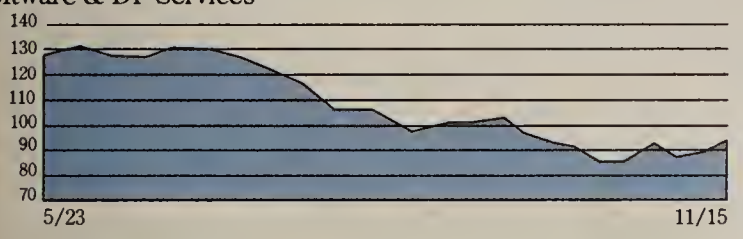
Communications



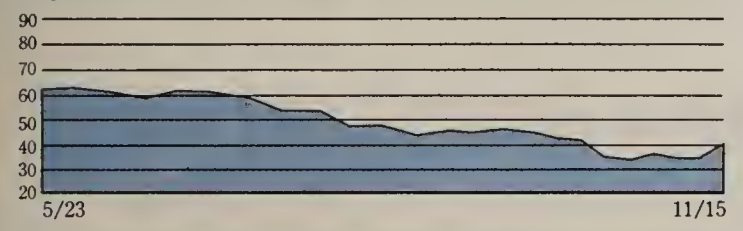
Computer Systems



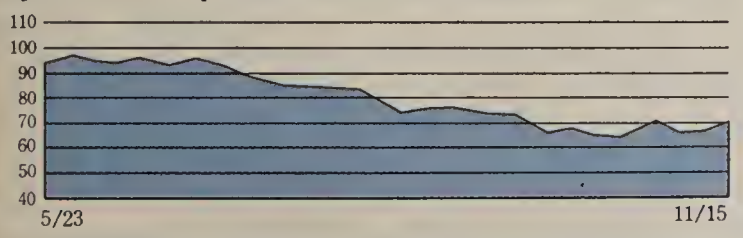
Software & DP Services



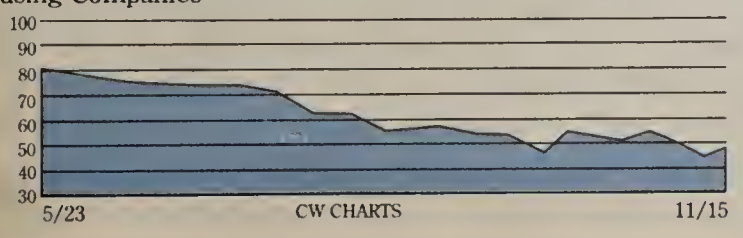
Semiconductors



Peripherals & Subsystems



Leasing Companies



Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, NOV. 14, 1990

EXCH		52-WEEK RANGE		PRICE CLOSE NOV. 14, 1990	WEEK NET CHNGE	WEEK PCT CHNGE
Communications and Network Services						
N	AMERICAN INFO TECHS CORP	68	53	65.625	1.4	2.1
Q	ANDREW CORP	26	16	18.75	1.3	7.1
Q	ARTEL COMM CORP	10	2	2.5	-0.3	-9.1
N	AT&T	47	30	33.75	0.1	0.4
Q	AVANTEK INC	5	2	2.375	0.5	26.7
N	AYDIN CORP	17	10	10.875	0.6	6.1
N	BELL ATLANTIC CORP	57	40	53.25	2.9	5.7
N	BELLSOUTH CORP	59	49	53.125	0.3	0.5
Q	COMPRESSION LABS INC	16	7	14	2.1	17.9
Q	COMPUTER NETWORK TECH	0	0	0.01	0.0	0.0
Q	CONTEL CORP	36	23	33.75	0.4	1.1
Q	DATA SWITCH CORP	4	2	2.875	-0.1	-4.2
Q	DIGITAL COMM ASSOC	27	9	11.875	1.8	17.3
Q	DYNATECH CORP	19	12	15.25	-0.5	-3.2
Q	FIBRONICS INTNL INC	13	5	9	1.8	24.1
Q	GANDALF TECHNOLOGIES	6	2	2.75	0.0	0.0
N	GENERAL DATACOMM INDS	5	2	2.125	0.3	13.3
N	GTE CORP	36	24	28.875	0.8	2.7
Q	INFOTRON SYS CORP	9	1	1.125	0.1	12.5
N	ITT CORP	61	40	48	2.0	4.3
N	M A COM INC	6	3	5	0.5	11.1
Q	MCI COMMUNICATIONS CORP	48	28	31.875	1.8	5.8
N	NETWORK EQUIP TECH INC	34	5	6.125	0.8	14.0
Q	NETWORK SYS CORP	15	8	10.375	1.8	20.3
N	NORTHERN TELECOM LTD	30	21	25.625	-0.3	-1.0
Q	NOVELL INC	30	12	30	3.0	11.1
N	NYNEX CORP	92	67	71.375	1.8	2.5
N	PACIFIC TELESIS GROUP	52	36	46.25	1.6	3.6
A	PENRIL CORP	9	5	6.5	0.3	4.0
N	SCIENTIFIC ATLANTA INC	29	9	11.125	1.6	17.1
N	SOUTHWESTERN BELL CORP	65	47	53	-2.0	-3.6
Q	3 COM CORP	19	5	8	0.9	12.3
N	U S WEST INC	41	32	36.875	0.3	0.7
Computer Systems						
Q	ALLIANT COMPUTER SYS	9	1	1	-0.3	-20.0
Q	ALPHA MICROSYSTEMS	5	1	2	0.4	23.1
A	AMDAHL CORP	19	10	13.375	1.5	12.6
Q	APPLE COMPUTER INC	48	24	37	3.8	11.3
Q	AST RESH INC	26	10	25.375	1.9	8.0
N	BOLT BERANEK & NEWMAN	8	4	4.5	-0.1	-2.7
N	COMPAQ COMPUTER CORP	68	36	51.625	5.3	11.3
N	COMMODORE INTNL	12	5	7.875	1.0	14.5
Q	COMPUTER AUTOMATION INC	6	0	0.938	-0.2	-16.6
N	CONTROL DATA CORP	22	8	10.375	1.1	12.2
N	CRAY RESH INC	51	20	27.875	2.6	10.4
N	DATA GEN CORP	14	4	4	-0.1	-3.0
N	DATAPOINT CORP	5	1	1.5	0.1	9.1
Q	DELL COMPUTER CORP	14	5	12.125	0.9	7.8
N	DIGITAL EQUIP CORP	95	46	52.25	4.8	10.0
N	FLOATING POINT SYS INC	4	0	1.25	0.0	0.0
N	HARRIS CORP	36	14	18.25	1.8	10.6
N	HEWLETT PACKARD CO	50	25	28.25	3.1	12.4
N	HONEYWELL INC	112	71	90.5	3.8	4.3
N	IBM	123	93	113.5	7.0	6.6
Q	INFORMATION INTL INC	14	8	8.75	0.0	0.0
Q	IPL SYS INC	14	5	10.25	1.1	12.3
N	MAI BASIC FOUR INC	4	1	0.938	-0.1	-6.2
N	MATSUSHITA ELEC INDL LTD	166	116	126.25	-0.3	-0.2
Q	MENTOR GRAPHICS CORP	26	9	11.25	0.5	4.7
N	NBI INC	1	0	0.156	0.0	10.6
N	NCR CORP	72	45	56.625	8.6	18.0
Q	PYRAMID TECHNOLOGY	36	12	15.375	0.9	6.0
Q	SEQUENT COMP SYS INC	34	13	19.625	2.6	15.4
Q	SUN MICROSYSTEM INC	37	15	18.625	1.0	5.7
Q	SYMBOLICS INC	2	0	0.25	0.0	-11.0
N	TANDEM COMPUTERS INC	30	9	12.5	2.3	22.0
N	TANDY CORP	44	24	28.875	4.5	18.5
N	ULTIMATE CORP	10	2	1.75	-0.3	-12.5
N	UNISYS CORP	17	2	3	0.1	4.3
A	WANG LABS INC	6	3	3	0.3	9.1
Software & DP Services						
Q	AMERICAN MGMT SYS INC	20	11	14.875	0.3	1.7
Q	AMERICAN SOFTWARE INC	18	8	11.375	1.0	9.6
N	ANACOMP INC	5	1	2.25	0.3	12.5
Q	ANALYSTS INTL CORP	24	10	12.75	0.3	2.0
Q	ASHTON TATE	15	5	7.875	0.9	12.5
N	AUTO DATA PROCESSING	60	45	54	3.0	5.9
Q	AUTODESK INC	60	32	45.75	5.0	12.3
Q	BMC SOFTWARE INC	30	17	22.5	2.9	14.6
N	BUSINESSLAND INC	12	1	1.75	0.3	16.7
Q	COGNOS INC	10	4	7.375	-0.1	-1.7
N	COMPUTER ASSOC INTL INC	17	4	7.625	0.6	8.9
Q	COMPUTER HORIZONS CORP	17	8	14.375	1.6	12.7
N	COMPUTER SCIENCES CORP	59	37	45.875	1.9	4.3
N	COMPUTER TASK GROUP INC	12	7	6.875	-0.3	-3.5
Q	COMSHARE INC	25	14	18	0.8	4.3
Q	CORPORATE SOFTWARE	16	4	7	2.3	47.4
N	GENERAL MTRS (CLS E)	38	24	34.875	2.4	7.3
Q	GOAL SYSTEMS INTL	18	8	9.25	0.8	8.8
Q	HOGAN SYS INC	7	2	2.375	0.0	0.0
Q	INFORMIX CORP	18	4	4	0.0	0.0
Q	INTELLICORP INC	8	1	2.063	0.3	17.9
Q	LEGENT CORP	31	17	23	3.6	18.7
Q	LOTUS DEV CORP	39	13	17.75	-0.9	-4.7
Q	MICROSOFT CORP	81	38	69.5	5.8	9.0
Q	NATIONAL DATA CORP	35	8	13.875	2.9	26.1
N	ON LINE SOFTWARE INTL INC	11	4	4.125	0.1	3.1
Q	ORACLE SYS CORP	188	5	6	0.4	6.7
N	PANSOPHIC SYS INC	19	7	7.75	0.4	5.1
Q	PHOENIX TECHNOLOGIES INC	5	1	1.75	0.1	7.7
N	POLICY MGMT SYS CORP	43	30	39.25	3.0	8.3
Q	PROGRAMMING & SYS INC	13	5	5.5	-5.3	-48.8
Q	RELATIONAL TECH INC	10	3	9.125	0.0	0.0
N	REYNOLDS & REYNOLDS CO	27	12	14.5	1.5	11.5
Q	SAGE SOFTWARE INC	16	8	10.125	0.3	2.5
Q	SEI CORP	22	15	16.75	0.8	4.7
Q	SHARED MED SYS CORP	17	12	15.25	0.0	0.0
Q	SOFTWARE PUBG CORP	28	12	17.5	2.3	14.8
N	STERLING SOFTWARE INC	11	6	7.125	0.3	3.6
Q	SUNGARD DATA SYS INC	26	10	13	1.6	14.3
N	SYSTEM CENTER INC	25	6	8.75	1.6	22.8
N	SYS. SOFT INC	29	13	22.5	2.0	9.8
Q	WORDSTAR	2	1	1.125	0.1	5.8
Semiconductors						
N	ADV MICRO DEVICES INC	11	4	4.75	1.0	26.7
N	ANALOG DEVICES INC	10	6	5.875	0.1	2.2
Q	ANALOGIC CORP	10	8	8.375	0.0	0.0
Q	CHIPS & TECHNOLOGIES INC	24	5	7.125	0.9	14.0
Q	INTEL CORP	52	28	37.875	3.4	9.8
Q	MICRON TECHNOLOGY INC	16	7	9.625	2.3	30.5
N	MOTOROLA INC	88	51	56	1.0	1.8
N	NATL SEMICONDUCTOR	9	3	3.875	0.1	3.3
N	TEXAS INSTRS INC	44	23	27.75	2.0	7.8
A	WESTERN DIGITAL CORP	15	4	5.25	0.1	2.4
Peripherals						
Q	ALLOY COMP	2	0	0.344	0.1	37.6
N	AM INTL INC	6	1	1.75	0.3	16.7
Q	AUTO TROL TECH CORP	4	2	2.063	0.0	0.0
Q	BANCTEC INC	24	10	12	1.0	9.1
A	COGNITRONICS CORP	7	3	5.625	0.3	4.7
Q	CONNER PERIPHERALS	31	11	25.375	3.5	16.0
A	DATARAM CORP	22	8	8.75	0.6	6.9
N	EASTMAN KODAK CO	44	34	42	3.1	8.0
N	E M C CORP MASS	10	3	9	1.8	24.1
Q	EMULEX CORP	9	4	5.25	0.3	5.0
Q	EVANS & SUTHERLAND	35	14	15.75	0.3	1.6
Q	ICOT CORP	2	0	0.375	-0.2	-33.4
Q	INTERLEAF INC	8	3	3.5	0.3	7.7
Q	IOMEGA CORP	6	3	4.375	0.3	7.7
Q	MASSTOR SYS CORP	3	0	0.188	-0.1	-39.9
Q	MAXTOR CORP	17	4	4.75	0.1	2.7
Q	MICROPOLIS CORP	10	3	6.375	0.6	10.9
N	MINNESOTA MNG & MFG CO	91	74	80.5	1.6	2.1
Q	PERSONAL COMP PRODUCTS INC	5	4	3.625	0.0	0.0
Q	PRINTRONIX INC	15	6	9	0.6	7.5
N	QMS INC	21	9	13.25	2.0	17.8
Q	QUANTUM CORP	26	9	20	1.8	9.6
N	RECOGNITION EQUIP INC	8	4	4.625	-0.4	-7.5
Q	REXON INC	10	4	5.5	-0.1	-2.2
Q	SEAGATE TECHNOLOGY	20	6	9.125	0.4	4.3
N	STORAGE TECH CORP	35	11	19.5	3.6	22.8
Q	TANDON CORP	4	1	1.719	0.0	1.8
N	TEKTRONIX INC	19	12	17.125	1.1	7.0
Q	TELEVIDEO SYS INC	1	0	0.25	0.0	0.0
N	XEROX CORP	60	29	34.125	3.0	9.6
Leasing Companies						
N	CAPITAL ASSOC INTNL INC	5	1	0.75	0.1	20.0
N	COMDISCO INC	29	15	16.5	0.9	5.6
Q	LDI CORPORATION	18	10	9.5	-0.5	-5.0
Q	PHOENIX AMERN INC	6	3	5.25	0.6	13.5
Q	SELECTERM INC	7	3	3.25	0.5	18.2

EXCH: N=NEW YORK; A=AMERICAN; Q=NATIONAL

Back on track

Investors take a chance again and test high-tech waters

They're baaaaaack. Or at least they are attempting to return. Although technology stocks suffered a down day on Thursday, many closed on the upside for the week, thanks to early-week jumps.

The glitz and hype of the Comdex/Fall '90 show in Las Vegas last week must have inspired investors to gamble on microcomputer-related stocks. Traders dropped a bundle on Compaq Computer Corp., which picked up 2 points to close Thursday at 51⅛. Lady luck was with IBM, apparently, as the firm moved up 2⅜ points to 112⅝. Even Apple Computer, Inc. got into the act, rising ½ a point to 36. Cautious-cum-confident investors pushed Microsoft Corp. up a hefty chunk to 67⅞ — a gain of 3⅛ points for the week.

Other personal computer product makers seemed like shrewd bets as well. Adobe Sytems, Inc. ballooned 3⅝ points to 29⅝, while Conner Peripherals, Inc. won ⅝ of a point, finishing Thursday at 24¼.

Rumors flew again last week about the deal in the works between AT&T and NCR Corp., with NCR coming out the favorite. While AT&T inched up just ⅛ of a point to 33⅛, NCR soared 3¾ points to 58½.

Not everyone was making happy talk, however. Motorola, Inc. sagged under weighty doubts about its hold on the cellular phone business, losing 2⅜ points to 52¼.

And how low can they go? Unisys Corp. and Wang Laboratories, Inc. are neck and neck — or maybe it's ankle and ankle. Each closed at 3 points, floating just above 52-week lows — and this after an ⅛-point gain for each last week. Fellow large systems maker Digital Equipment Corp., however, copped a 1¾-point gain to 51⅛.

Most software action was unspectacular. Oracle Systems Corp. grew by ¾ of a point to 6⅝, and Lotus Development Corp. fell ⅝ of a point to 17⅝. Novell, Inc., however, climbed up 1¼ points to 28¾.

KIM S. NASH

NEWS SHORTS

Sabre, Amadeus to link up

American Airlines' Sabre Travel Information network and Europe's Amadeus Global Travel Distribution network will link up in an effort to expand business outside of their home markets, according to Max Hopper, senior vice president of information systems at AMR Corp., American Airlines' parent company. The alliance reportedly involves no equity ownership by either party. Phase one will establish multiaccess connections from the Sabre computerized reservation system to Air France, Iberia, Lufthansa and Scandinavian Airlines System. The linkage will take approximately five to six months to implement. The second phase will add ticketing to the scheduling and availability information-sharing capabilities.

Sabre currently has 85,000 travel agent stations installed worldwide. Amadeus supports about 40,000 terminals.

. . . . . .

Calling Europe to get cheaper

The UK's ministry of trade and industry broke new ground last week by announcing that it will permit the resale and shared use of international circuits between Britain and other countries. This will open the way for a whole new networking industry that will buy bandwidth from British Telecom, Inc. and other UK carriers and resell it to cost-conscious global users, according to Len Elfenbein, president of market research firm Lynx Technologies. The UK's move will put pressure on other European administrations to follow suit, Elfenbein said, because U.S. users will increasingly use shared links to England to get to the rest of Europe rather than set up the more expensive direct dial lines to other countries.

. . . . . .

System tamperproofs on-line work

Two researchers at Bellcore will show off today a tamperproof new process of affixing a time-stamp seal to an electronic document, much in the same way a notary stamps paper documents to certify their authenticity. "With electronic documents, there is no way to know what part of the document is authentic and what part has been altered after the fact," said Stuart Haber, who devised the time-stamp process along with Scott Stornetta. The researchers said that subscribers to an "electronic notary" service could submit documents electronically for time-stamping and would receive a "digital receipt" that could be used to prove when the document was created.

. . . . . .

DEC ports software to RS/6000

Digital Equipment Corp. will port its Powerframe engineering-tool framework to IBM's RISC System/6000 family, DEC said last week. This marks the first time that DEC has made its applications software available on an IBM platform. While DEC has provided networking software from its computers to IBM machines for some time, the announcement positions it as a competitor to IBM in the area of technical computer-aided software engineering (CASE) tools. Powerframe already runs on Apollo and Sun Microsystems, Inc. computers, as well as on Decstations and Decsystem servers.

. . . . . .

Businessland names president

Belabored Businessland, Inc. has taken on a No. 2 man to fight beside Chief Executive David Norman in the battle of the margin squeeze. Edward R. Simon Jr. takes over the chores of president from Norman and the vacated post of chief operating officer, the personal computer dealer chain announced last week. Simon, 51, spent 20 years at international office furniture maker Herman Miller, Inc., where he started as MIS manager and worked his way up to president.

. . . . . .

Microsoft blinks on LAN support

Microsoft Corp. announced 30 days of free support for its LAN Manager network operating system, effective immediately for all current and future customers. After the 30-day period, said a spokeswoman for the Redmond, Wash.-based company, support can be purchased from Microsoft, a network specialist or a combination of the two. The move comes amid complaints by network managers about poor support for both hardware and software from such vendors as Microsoft and Novell, Inc.

Claims

FROM PAGE 1

among telephone operators at its Denver-area offices.

The Denver offices spent $2 million on European ergonomic chairs, adjustable workstations, soft-touch keyboards, training videos on work breaks, exercises and even wristband "ergometers" that beep when wrist muscles are too tense.

Baca said the number of current repetitive trauma cases at the Denver offices is down to three, but further improvements in the area of job design are possible. She said a joint labor/management committee is considering a job-sharing program so that operators could do other office work away from their terminals.

Repetitive motion disorders include a wrist ailment called carpal tunnel syndrome, tendinitis and other arm and back problems caused by the "cumulative trauma" of doing repetitive work in uncomfortable positions [CW, June 26, 1989]. The illness — usually a shooting pain or numbing sensation in the hand, wrist or arm — afflicts assembly-line workers and keyboard users such as data-entry clerks, newspaper editors and cashiers.

Repetitive motion syndrome accounted for only 18% of all job-related illnesses in 1981, but that share rose steadily to 33% in 1986, 48% in 1988 and 52% in 1989, the government said.

Until research provides more information about the problem, ergonomists support a "shotgun approach" of job redesign to provide variety, adjustable chairs, rest breaks, training computer users on posture and placing keyboards, screens and paperwork in comfortable positions.

"The worker's compensation costs are spiraling and sometimes ridiculously so when you see how simple some of the solutions are," said Kathryn G. Parker, director of ergonomics at Health & Hygiene, Inc. in Greensboro, N.C.

Studies have shown that proper ergonomics can boost the productivity of office workers by 25%, according to Marvin Dainoff, director of the Center for Ergonomic Research at Miami University in Oxford, Ohio.

The syndrome apparently is widespread in the newspaper industry. A recent survey by The Newspaper Guild, based in Silver Spring, Md., found more than 1,500 union-represented newsroom employees with symptoms of the illness. Also, seven journalists have filed lawsuits seeking $288 million in damages against Atex, Inc., alleging that the vendor's computer terminals are responsible for their cumulative trauma disorders [CW, July 2].

The Occupational Safety and Health Administration (OSHA) has begun to focus on ergonomics in meat-packing and manufacturing industries, but official guidelines for office environments may be a few years away. The agency does not plan any office raids, but an OSHA inspection of office environments could be triggered by employee complaints or could be included in a facilitywide inspection, according to speakers at a recent conference on ergonomics.

Ergonomics experts such as Marilyn Joyce, president of the Joyce Institute in Seattle, caution against going overboard on superadjustable workstations and strap-on wrist splints.

Joyce said total adjustability is needed if different people will use the workstation, but in most cases, a flat surface with an adjustable chair can produce the ideal, the flat wrist. "You don't really have to buy a lot of expensive work surfaces if you get good chairs" and train people how to use them, she said.

NEC expected to increase stake in Bull

BY NELL MARGOLIS
CW STAFF

Reports surfaced in Europe last week that NEC Corp., the Japanese telecommunications and electronics conglomerate, is poised to increase its stake in struggling French state-owned computer vendor Groupe Bull, possibly to majority level.

Computerworld Norge, the Norwegian sister publication of *Computerworld,* said "reliable sources" indicated that ongoing confidential negotiations between NEC and Bull are expected to result in closer working ties and a probable infusion of Japanese capital.

Bull Chairman Francis Lorentz declined to comment.

Bull's recent reorganization included plans for a 5,000-person worldwide layoff and closing seven of its 13 plants by the end of 1992. The firm's soon-to-be-released financial report for 1990 is expected to show losses in the $551 million ballpark.

"Given the rather substantial losses that Bull has posted, and given the large government share, it wouldn't be at all surprising to learn that the [French] government wants to spread the risk by having NEC buy further in," said Paul Zorfass, an analyst at The Yankee Group in Boston.

NEC, which also supplies Bull's 9000 line of large systems, currently holds a minority stake in Bull's U.S. subsidiary.

"When Fujitsu bought ICL [CW, July 23], we figured NEC had to do something to counter," said Sheridan M. Tatsuno, president of Neoconcepts, a Fremont, Calif., consultancy specializing in the Pacific Rim technology market.

Computerworld *staff members Sally Cusack and Ellis Booker contributed to this story.*

Information Builders focusing on Focus

Information Builders, Inc. announced new products at its international users' conference in Vienna last week. Among the additions are Unix versions of its Focus fourth-generation language.

Also, Information Builders said it will support graphical user interfaces on Focus, including IBM's Presentation Manager, Microsoft Corp.'s Windows 3.0 and Apple Computer, Inc.'s Macintosh. Furthermore, the company will extend Focus' abilities to support cooperative and distributed processing and will deliver a new, more modular language. Another direction is to provide its Level5 object-oriented expert system across more platforms, including mainframes and minicomputers.

The New York-based firm will pursue these goals during 1991, company executives said.

In the meantime, users will be able to get the following new versions of Focus:

- PC/Focus Plus, which runs in extended memory on Intel Corp. 80286- and 386-based personal computers. This version, available now, frees up the 640K bytes of standard memory to run memory-resident programs instead of Focus, the company said.
- Focus for Unix platforms, including System V Release 4 and Digital Equipment Corp.'s Ultrix/SQL, which is the database management system DEC bundles with its Ultrix Unix-like operating system. Information Builders is also making Unix graphical user interfaces available, including the Open Software Foundation's Motif and AT&T's Open Look, in the first quarter of 1991.
- Focus for Groupe Bull platforms, running either the Unix or GCOS operating systems. These are available now, except for Focus running under GCOS8, which is expected to be ready early next year.
- Focus for Tandem Nonstop computers, available now.

COMDEX NOTEBOOK

Blame it on fallen arches or just fallen promises, but several users reached the flashpoint and got a chance to wag a finger at one industry heavy. At one conference session, a user asked Leland Reisweig, IBM's vice president of programming, when Microsoft's LAN Manager and IBM's OS/2 LAN Server would be merged. "In the future," Reisweig replied with a smirk as fellow panel members tittered. Another frustrated user shot back to scattered applause: "That's exactly the kind of evasive answers that we're always getting from you people and which drive us all crazy."

"Shapely shenanigans shake up the show." That campaign earns Sys Technology what is fast becoming the annual Comdex award for sexist promotions. The vendor, which manufactures network equipment, invited attendees to its booth to ogle a scantily clad "Miss Sys" during her "eye-catching debut" in a "live aerobic" session, after which they were to be treated to an autographed poster of the sweaty Miss Sys.

Just a few months down the road from his winning the fight over the patent for the microprocessor on a chip, inventor Gilbert Hyatt claimed a new victory. Hyatt said he was recently awarded a patent for a technology that enhances the performance of dynamic random-access memory chips so greatly that it can boost system throughput by an average of 300% through changes to the memory controller and system motherboard.

Comdex attention-getters are of no use if attendees see only empty seats at the booth. So minutes after the Las Vegas Convention Center's doors opened on Monday morning, the first attendees saw a Wang Laboratories, Inc. pitchman already in progress with his presentation and an audience of a dozen people on the edge of their seats. However, the audience, like all of Wang's booth staff, happened to be dressed in the uniform of the day — white shirts and dark slacks and skirts.

Everex Systems, Inc. had a 50-MHz version of its Stepcube on display at Comdex [CW, Oct. 8]. Arche Technologies, Inc., based in Fremont, Calif., was the other hardware vendor to use Santa Clara, Calif.-based Velox Computer Technology, Inc.'s Icecap solid-state technology to jack up the performance of an Intel Corp. I486 33-MHz chip to 50 MHz.

AOX, Inc. blazed a trail with the demonstration of its OS/[bus] Master software, which enables multiple operating systems to execute simultaneously in IBM Micro Channel Architecture computers based on the Intel Corp. 80286 and 80386 chips. Available in the first quarter of next year, the software runs with AOX's Micromaster 386 33-MHz and I486 bus master system upgrade cards. AOX said it will support DOS, OS/2, The Santa Cruz Operations' SCO Unix System V, IBM's AIX, Novell, Inc.'s Netware 386 and Microsoft's LAN Manager.

AST Research, Inc. managed to attract the attention of one small group at Comdex that it probably wished it hadn't. Show-goers zipping through the main gate to the Las Vegas Convention Center were met by a tiny but determined group of picketers. Waving signs saying "AST unfair," and "AST, you have powerful attorneys," the picketers carried other signs implying that AST had walked away from a warehouse lease and has not paid the balance of its contract. The picketers were reportedly hired and transported to Las Vegas by the irate warehouse owner. An AST spokeswoman would say only that the contract in question had been "invalidated" by the other party.

IBM's multimedia demonstration of an "aging" application added years to the visage of one well-known and seemingly ageless industry figure: Microsoft Chairman Bill Gates. After viewing his baggy and wrinkled visage, the boyish Gates stood up and suggested Cannavino pick on someone "your own age." To which Cannavino replied, "Bill, working with you has already aged me 10 years." Whispered one IBM business partner: "He's not kidding." The application is used by the National Center of Exploited and Missing Children to create up-to-date representations from photos of children who have disappeared years earlier.

Compiled by Patricia Keefe, James Daly, James Connolly and Michael Fitzgerald.

Gates heralds next generation

BY JAMES DALY
CW STAFF

LAS VEGAS — As the economic slowdown begins to take its toll, Microsoft Corp. President Bill Gates assumed the role of the Moses of the personal computer industry last week and waved vendors and users away from myopic old habits and toward a promised land of increased product usefulness.

Gates blamed corporate feudalism and the obsessive concerns of providing incremental product advances for five straight years of slipping PC sales during his 45-minute keynote address at Comdex/Fall '90. "We need a common vision," he said. "The driving notion for hardware and software technology must focus on making things easier . . . We must go beyond thinking about developing smaller and faster computers or about developing software applications that have better features."

Although Microsoft remains one of the few industry giants that has been immune to the crunch of a slowing economy, Gates used his speech as a model of industry unanimity, eliminating any direct references to Microsoft products and often blowing verbal kisses at rivals such as Apple Computer, Inc.

Gates called his blueprint "Information at Your Fingertips," a concept in which the act of working within a specific application is supplanted by the notion of integrating applications. "The first phase of making life easier was what-you-see-is-what-you-get," said Gates from the stage at the Las Vegas Hilton Showroom where, in 1969, Elvis Presley made his comeback to live performance. "The next phase is what-you-see-is-what-you-need-to-get."

Andy Freeberg

Gates issues call *for "a common vision"*

Today, if workers need to create a document composed of text, spreadsheets and graphics, they must often pull together separate applications that sometimes involve different nonconforming data formats. Additionally, they must explicitly direct an application to do something by typing commands or clicking on a menu.

An architecture must be created, Gates said, that treats data and applications as intelligent "objects" that interact and exchange data. In an object-oriented system, everything is a self-contained entity that is aware of the actions that are appropriate to it, he said.

Applications will also employ an "embed and link" philosophy in which data can be combined from several applications into one document and live links can update all of the elements of the document when data changes.

Gates illustrated the data linking concept with a series of short illustrative film clips that parodied the television program *Twin Peaks*.

Microsoft is still struggling to provide such an interactive product, although an object-oriented Windows Version 4.0 is reportedly in the works. Additionally, Microsoft officials said much of the technology Gates outlined in his address will emerge in upcoming products from both Microsoft and third-party vendors.

Software

FROM PAGE 1

"The power and rich functionality of the minicomputer proprietary software environment is the thing that's missing," said Tom Willmott, vice president at Aberdeen Group, a consulting firm in Boston.

"You now have this gigantic plethora of [hardware] alternatives, but you don't have any software to take advantage of it," agreed Frank Dzubeck, president of consultancy Communications Network Architects in Washington, D.C.

Minicomputer software developers have not been eager to port their proprietary applications over to PC platforms, according to George Thompson, an analyst at Datapro Research Corp. in Delran, N.J.

The reasons: not enough of an installed PC server base to make it profitable, and the scope of the task means a plodding pace at best, Thompson said.

Even Compaq finds it tough to sell its Systempro as a replacement for minicomputer networks — primarily because of a lack of comparable PC-based applications. Product marketing manager Lorie Strong said, "If [users] are developing a new project and writing the application themselves, then we're in a good position to sell Systempros."

But all this may soon change. The growing number of lower-priced PC server rollouts will soon entice minicomputer software makers to migrate their applications over to lower-cost PC platforms, Willmott said.

The first of these will arrive next year and will likely be versions of integrated office applications like IBM's Officevision, analysts said. But the big year for hardware and software sales will be 1992, they agreed.

Even if the applications start arriving in force, the operating systems for the highest level multiprocessor PCs still pose a concern. Less than a year ago, there were no multiprocessor operating systems available. Today there are only a handful, and these are modified for specific machines.

"You can't move an operating system tooled for the Systempro over to a different architecture like Parallan [Computer, Inc.]," Dzubeck said.

ALR hopes to capitalize on the dearth of platform-independent operating systems with its Systempro-compatible Powerpro. ALR engineered it to use some of the Systempro operating systems [CW, Nov. 12].

Some users do not seem to mind the proprietary conditions. Citibank NA is testing two Netframe Systems, Inc. servers running a specialized version of Novell, Inc.'s Netware. "The machine had enough backers by large companies," systems officer Louis Arena said.

Still, even users such as Arena who have joined the PC battle have a few objections. "The client/server software is just not out there," Arena said. Like most superserver users, Citibank developed its own applications, in this case built around Fox Software, Inc.'s Foxbase.

SX-based laptop flow begins

LAS VEGAS — Comdex/Fall '90 was awash with the first wave of a coming deluge of Intel Corp. 80386SX-based notebook-size computers. One indication of things to come was the Intel Corp. booth at the show, which was sprinkled with no less than 14 unannounced prototypes of SX-based notebooks.

Irvine, Calif.-based AST Research, Inc. unveiled what may be the first CPU-upgradable notebook on the market. Users can replace the Intel 80286 chip in the Premium Exec 286/12 with a 20-MHz 386SX chip. AST will also sell the Premium Exec with the SX chip installed.

Sanyo's 16-MHz SX-based entry, the MBC-18NB, weighs 6.9 pounds and features an IBM Video Graphics Array display, bundled DOS 4.01, 1M byte of random-access memory, a built-in floppy and a 20M-byte hard disk with 23 msec access time.

RICHARD PASTORE

Microsoft: At your fingertips

BY PATRICIA KEEFE
CW STAFF

LAS VEGAS — Microsoft Corp. once again took to the helm of an industry problem, busying itself last week at Comdex/Fall 90 touting its latest standards effort, this time for object-oriented compound document interchange.

Microsoft and other major developers will hold a briefing on Dec. 10 to describe the architecture, reveal plans for the code and provide copies of the documentation.

The proposed standard is a key piece of Microsoft's "Information at Your Fingertips" campaign, which purports to make computing easier in part by bringing together DOS, Windows and OS/2 under a graphical system and by expanding upon that combination to create a more powerful environment.

Eventually, applications themselves would be redefined by this process, according to Microsoft executives, whose vision calls for turning a host of operating system elements into objects, including the file system, advanced computer languages, tools for building application interfaces and user shell.

For example, by turning the prompt, file manager and program selector into objects under the user shell, functions such as moving, copying and linking information within and between documents will no longer have to be included in individual applications, Microsoft claimed. Developers would then be free to concentrate on adding expanded features to their applications, said Russ Werner, a Microsoft general manager.

Microsoft said it will license the specifications to developers at no charge. To be successful, the standard must be used by all vendors across all platforms and by every application, Microsoft Vice President Mike Maples said.

"We are working with a number of developers who have agreed upon a relatively tight specification," he said.

Users today tend to work closely with three or more applications, often switching back and forth between each while building a document in one. The process involved can hardly be considered smooth computing.

One of Microsoft's goals is to simplify the relationship between different applications and between the user and those applications.

As proposed, the object-oriented document interchange standard would reportedly eliminate the need for a user in one application to have to boot up a second package in a separate window, cut the data needed, store it, close the window and then paste it into a document in the first application. Today, the user must explicitly ask the computer to do something, typically by typing in commands or clicking on a menu.

What Microsoft is proposing instead is to allow the user to retrieve data behind a chart simply by double-clicking on the icon representing the chart, and all the opening and closing would happen behind the scenes. The user would never need to know in which application data resides. In other words, in an object-oriented environment, everything is a self-contained entity that is aware of the actions that are appropriate to it.

Eventually, the lines between all applications would "decompose," streamlining desktop computing, Werner said.

This is achieved in part by object linking and embedding, which Werner described as an evolution of the Dynamic Data Exchange protocol.

Embedding means that objects in a document are stored with it. Linking ties together related data stored in two separate applications.

Also, embedded objects are automatically updated, and as the document moves around the system, so will all of its components.

Multimedia seen clearing standards, cost hurdles

BY PATRICIA KEEFE
CW STAFF

LAS VEGAS — Viva Multimedia! That theme resounded throughout IBM's booth, presentations and briefings at last week's Comdex/Fall '90 show. Despite copious efforts by IBM and Microsoft Corp. to portray multimedia as alive and well, the emerging market is hobbled by a perception that it is too expensive, IBM multimedia czar Michael Braun lamented in an interview at Comdex last week.

Two weeks ago, Braun was appointed to the newly created post of vice president of the Multimedia and Educational Division. Despite the hubbub about the emerging market, he said it is "premature" to discuss too many details about IBM's multimedia strategy.

Multimedia is not only affordable, but it is here today, Braun claimed. An investment of about $300 for an audio card and related software will bring sound to desktop users, he said. Audio-only applications have the most potential, followed by audio combined with still images, he said.

Cost becomes less of an issue where there is clear justification for a system that will live many years to perform a task. But where enterprisewide decisions are concerned — for example, putting voice annotation across all desktops — careful deliberation is required, according to Braun.

The standards issue, which has presented problems, is fading fast, he said. The industry has reached general agreement on the J-Peg still-image capture standard and is moving quickly toward cementing the M-Peg, or motion picture standard, Braun added.

And despite a claim that software developers are beginning to "really go after" multimedia, Braun said the following changes in software are needed to boost multimedia acceptance:

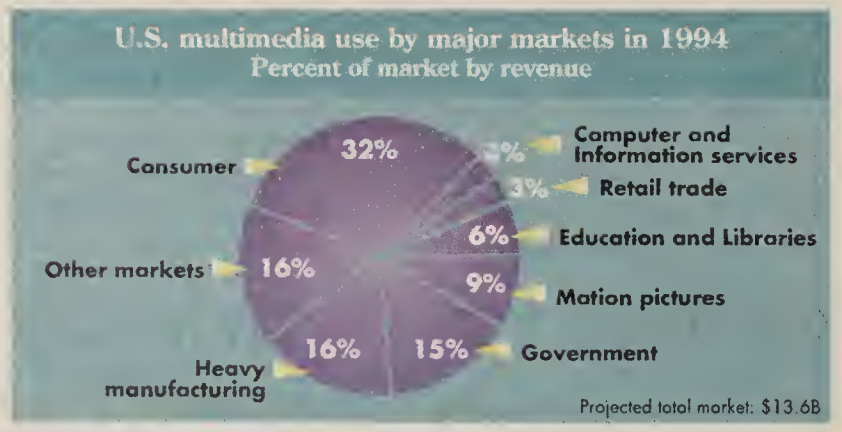
- Certain multimedia features need to be extended to the operating systems, i.e., OS/2 and the Microsoft Corp. Windows environment. Today, a variety of tools exist that seek to solve certain technical issues, each in different ways. Extensions to the operating system would alleviate the need for separate tools.
- Agreement on a data standard that will store audio integrated with still formats so that all tools could deal with them interchangeably.
- More software titles.

Braun also outlined the following options available to Personal System/2 users:

- Audio Capture and Playback card, which lists at $370.
- Video Capture Playback card, which lists for $750. It can be used to capture still images.
- M-Motion analog video card. Listed at $2,200, it requires the Enhanced Control Program software, which costs $150.
- Action Media digital video card, which comes in two pieces. The card that does the digitizing costs $2,250; the card that does the playback costs $1,995.

Multimedia vision

One of the attractions drawing industry attention to multimedia products is the wide array of markets targeted for applications



Source: Information Workstation Group — CW Chart: Doreen St. John

Optical options increase

Growth of disc storage evident at show

BY MAURA J. HARRINGTON
CW STAFF

LAS VEGAS — Comdex/Fall '90 attendees seeking out an affordable optical storage subsystem for an environment where performance is key may have been encouraged by the increase in optical disc storage options since last year.

Several vendors displayed the latest state-of-the-art compact disc read-only memory (CD-ROM), write-once read-many (WORM), rewriteable eraseable optical disc subsystems and multifunction subsystems at last week's show.

The following were among the introductions:

- Iomega Corp., the manufacturer of removeable storage systems, announced a 650M-byte eraseable magneto-optical storage system that it said will operate in the Unix, OS/2 and Novell, Inc. Netware 286 environments.
- Toshiba America Information Systems, Inc. demonstrated a CD-ROM product for extended technology applications — called XA technology — that can compress and record audio alternately with related graphics and text on the same track. Toshiba's XA drive is due out by the second quarter of 1991 and will include a small computer systems interface drive and application development tools, according to Jerald Higgins, vice president of marketing/optical disc drives for the Toshiba division.
- Pioneer Communications of America announced last week it was decreasing the access time and increasing the storage capabilities of its CD-ROM minichanger, an optical disc jukebox that allows users to access multiple discs.
- Panasonic Communications & Systems Co.'s Office Automation Group introduced a 5¼-in. rewriteable magneto-optical disc drive that is designed to allow a user to store up to 652M bytes of information on a single double-sided disc and change the information as necessary, the company said.

Priced at $4,500, with the discs costing $250, the product is scheduled to begin shipping in January 1991.

- JVC (Victor Company of Japan Ltd.) announced an internal, 5½-in., WORM drive and said the discs used in the system can be played on standard CD-ROM drives.
- Sony/Publishers Data Service Corp., a division of Sony USA, introduced three CD-ROM premastering systems that produce output in write-once, rewriteable and digital audiotape formats.

Video storage

IBM showed a 3½-in., 128M-byte read/write optical disc and disc drive at Comdex/Fall '90 last week and said that it had applied to the American National Standards Institute to have it adopted as a standard format.

IBM Vice President Robert Carberry said the disc had the same capacity as 85 floppy disks but would cost "much less than half" the cost of 85 disks. He added that the disc could be used for either full-motion video or for large programs of the sort that multimedia applications are expected to be.

While some competitors and developers said the drive is too slow and too small, especially when compared with hard drives, it runs at the maximum small computer systems interface rate and has the advantage of being able to run full-motion images frame by frame without hardware compression.

Carberry said the drives could be read-only memory as well as read/write, which would allow for economies of scale in the production.

MICHAEL FITZGERALD

AMD wins Round 1 in '386' fight

Right to use nomenclature not the end of Intel chip battle

BY MAURA J. HARRINGTON
CW STAFF

LAS VEGAS — Advanced Micro Devices, Inc. (AMD) has scored at least a symbolic victory in its battle to break Intel Corp.'s lock on the market for 80386 processors. A California judge rebuffed Intel's attempt to prevent AMD from using the "386" moniker in a soon-to-be-released clone chip that was on display here at Comdex/Fall '90 last week.

Senior District Court Judge William Ingram, in a ruling Nov. 16, denied Intel's request for a temporary injunction to prohibit Sunnyvale, Calif.-based AMD from using the nomenclature.

Although the chip, which will officially be called the AM386 when it is introduced, represents an alternative to Intel's monopoly supply of 386 processors, it remains unclear whether AMD will be able to bring competitive pressure into that market, which presumably would bring prices down.

Also last week, AMD announced it will lay off 200 workers by the end of the year. The company has posted losses in its most recent financial quarters.

The 80386, rapidly becoming the microprocessor of choice for personal computers, remains at the center of a long-standing dispute between Santa Clara, Calif.-based Intel and AMD.

Second thoughts

AMD has been able to manufacture the earlier Intel 80286 chip design under a common semiconductor industry practice known as second-sourcing. Computer vendors concerned about a reliable supply traditionally required chip manufacturers to establish alternate suppliers of their products. But, in a hotly contested departure, with the introduction of the 80386, Intel declined to allow AMD to second-source the more powerful microprocessor.

AMD contends that a 1976 agreement between the companies allows AMD to copy Intel's microcode for the 386. The microcode is the software program in a microprocessor that manipulates the hardware and controls the movement of data between the register in the CPU and the other boards in the computer.

Free market pressure

AMD is intent on breaking Intel's lock on the 80386 market in a bid to reap rewards similar to those received from earlier Intel chips

Percent of 1990 worldwide market share by revenue

	80286	80386
Intel	30%	100%
AMD	50%	
Harris	15%	
Siemens	5%	
Total market	$129M	$700M

Source: In-Stat, Inc. CW Chart: Paul Mock

An Intel spokeswoman said last week that the company was disappointed the judge ruled against it over the naming issue but indicated that Intel intends to take the issue to trial.

The dispute over the use of the numbers 386 began after Intel learned of AMD's new chip when a hotel worker sent a facsimile message — meant to be given to Michael Webb, director of marketing at AMD's Computer Systems Division — to an Intel employee also named Michael Webb, according to an AMD spokesman.

It is AMD's feeling, the spokesman added, that in attempting a temporary injunction, Intel management was trying to block AMD from selling the chip, because AMD feels the name is vital to the chip's success on the market.

"We feel the 386 name describes a function, just like the 80286 and the 8088 do, so we feel we have the right to the use of the numbers, as does the judge," an AMD spokesman said last week.

The Intel spokeswoman countered, "We have worked hard in establishing the identity of the product . . . it is Intel that invested in the technology that developed the product, and this is an infringement on our copyright."

"This is just a decision allowing AMD to use the 386 name until the litigation is solved," said semiconductor analyst Michael Slater, publisher and editor of "The Microprocessor Report."

"I don't think AMD customers would hesitate to buy an Intel clone, but AMD's chip has some features like static control and a plastic packaging that might cause customers to hesitate from buying the chip until the microcode litigation is settled," Slater said.

AMD said it will introduce two versions of its AM386 chip, one an identical clone to the 386DX chip and one with static control and other features, a spokesman said.

IBM backs video standard

BY MICHAEL FITZGERALD
CW STAFF

LAS VEGAS — IBM took a step last week toward providing a map that will lead to a new standard for high-end personal computer graphics display controllers, including a color format that could replace today's de facto standard offered by True vision, Inc.

Currently, users who want high-end graphics (1,024- by 768-pixel resolution) could take four paths: the Video Electronics Standards Association's (VESA) standard, Texas Instruments, Inc.'s Texas Instruments Graphics Array, IBM's new Extended Graphics Array (XGA) or a variety of proprietary offerings.

IBM became a potential mapmaker by joining VESA last week.

"At 1,024 by 768, there is no standard, and if anything, it's gotten worse" since IBM introduced XGA, said Jon Peddie, president of Jon Peddie Associates in Oakland, Calif., a PC graphics consulting firm. "VESA is [the] best hope for stabilizing this, and with IBM's participation, we have a good shot at finally getting a 1,024 by 768 standard."

Peddie said he expects that by Comdex/Fall '91, TI and proprietary vendors will have figured out how to make their current offerings compatible with VESA specifications.

He said he thinks the technology behind XGA will drive the standard, although it is possible that IBM will adapt the board to meet new specifications created through its participation with VESA.

"VGA has to push to get to the level that XGA starts at," Peddie said. "It's a totally different class of design."

IBM 486 portable big on power, price

BY RICHARD PASTORE
CW STAFF

Power-hungry road warriors said IBM's high-end portable, announced last week, would fit their needs and niche applications admirably. But they were confounded by the price of the Intel Corp. I486-based system and said they doubted whether any sizable demand exists for such a powerful, pricey portable.

"Ours is a special application that not a lot of people are going to have," said Steve Leopold, senior software applications engineer at Anritsu America, Inc., a telecommunications test equipment maker in Oakland, N.J. Anritsu engineers travel with 486-based portables to do software recompiling and demonstrations at client sites.

With the Personal System/2 Model 75, IBM joins only a handful of portable 486 personal computer makers. Leopold, who uses $13,000, 25-MHz 486 machines from Dolch Computer Systems, said he is glad to see another player in the market. The 400M-byte hard disk option on the Model 75 (also an option for other PS/2 models) is particularly appealing, he said.

"The 400M-byte [disk] would really come in handy. The 100M-byte disk in the Dolch is practically filled already," Leopold said.

The Model 75, which weighs 22 pounds and is powered by AC only, also comes with a 160M-byte disk option. It ships with 8M bytes of random-access memory, expandable to 16M bytes. The Micro Channel Architecture system supports small computer systems interface (SCSI) devices as well as OS/2, DOS and Microsoft Corp.'s Windows operating environments.

IBM Personal System/2 *Model 75*

The IBM Video Graphics Array (VGA) display offers 16 gray shades in a 10-in. gas plasma screen. The PC also supports IBM's Extended Graphics Array.

The box is set to ship at the end of the month and is priced at $18,890 for the 400M-byte hard disk version and $15,990 for the 160M-byte version.

"It sounds really intriguing, but those prices are putting that thing, for all practical purposes, out of our reach," said Claude Rankin, MIS director at accounting firm Deloitte Touche in New York.

For most of his portable applications, a 486 would be overkill at any price, Rankin said. But the machine's disk capacity and ability to download larger files is attractive, he added.

"I can think of instances in which I might want to put up to 50,000 data records on a portable, so the 486 does have some potential," Rankin said.

Compaq Computer Corp., which does not offer a 486 portable, sees little market potential for the machine.

"The price point is one reason why we haven't done it," said Michael Swavely, Compaq president, North America.

A second vendor to announce a 486 portable at Comdex/Fall '90 was Bitwise Designs, Inc. in Troy, N.Y. Bitwise's new $16,000 machine is distinguished from the IBM model by its weight (16 pounds heavier), color VGA display and 64M-byte maximum RAM. It also adds Intel's I860 processor to the motherboard for processing capability of 47 million instructions per second.

Bitwise started shipping a machine more closely parallel to IBM's this month. The 486-based Model 433/VP weighs 22 pounds and ships with 4M bytes of RAM, a 200M-byte SCSI hard disk and a VGA black and white display. It costs $12,000.

Midwest Correspondent Michael Fitzgerald contributed to this report.

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN 0010-4841) is published weekly, with a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
Copyright 1988 by CW Publishing/Inc. All rights reserved.
Computerworld can be purchased on 35 mm microfilm through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106. *Computerworld* is indexed: back issues, if available, may be purchased at $2.00 per issue, plus postage. Call (800) 669-1002.
Photocopy rights: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Publishing/Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 27 Congress Street, Salem, MA 01970, 508-744-3350.
Reprints (minimum 500 copies) and permission to reprint may be purchased from Sharon Bryant, CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. For Back issues contact Margaret McIndoe.
Requests for missing issues will be honored only if received within 60 days of issue date.
Subscription rates: $2.00 a copy: U.S. — $48 a year; Canada — $110 a year; Central & So. America — $130 (surface), $250.00 (airmail) a year; Europe — $195 a year; all other countries — $295 a year. Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin. Subscriptions call toll free (800) 669-1002.

MPA ABC ABP

POSTMASTER: Send Form 3579 (Change of Address) to *Computerworld*, P.O. Box 2044, Marion, OH 43305.

TRENDS

Executive computing is becoming more widespread. Companies in a variety of industries are hopeful and looking forward to getting a return on their investment

EXECUTIVE INFORMATION SYSTEMS

Highly satisfied

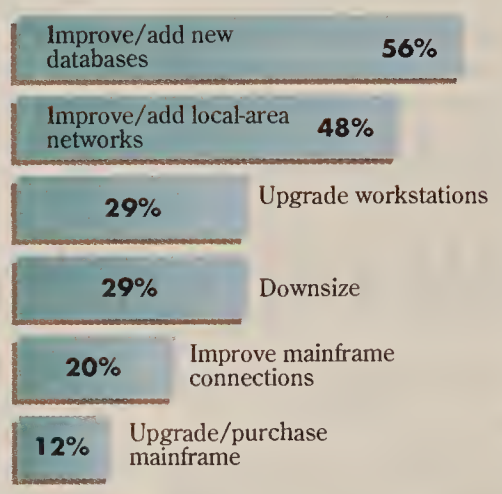
A high degree of satisfaction with executive information systems (EIS) is not limited to any particular industry. But the financial services industry proclaims to be the most satisfied with its EISs

Percent of respondents (base: 132)

Planned hardware improvements

EISs are becoming less centralized, with mainframes playing a smaller role, and interest in local-area network implementation and workstation upgrades is taking up the slack

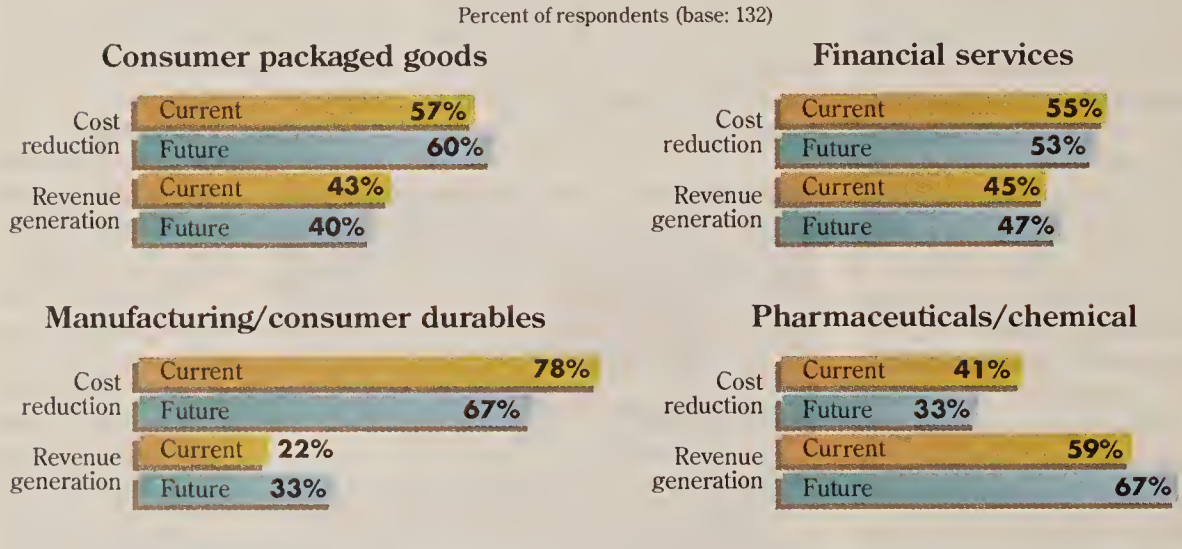
Percent of respondents (base: 132)
(Multiple responses allowed)



Return on investment

Cost reduction is the primary financial justification for executive computing investments in most industries, but increased revenue generation is an emphasis for pharmaceuticals

Percent of respondents (base: 132)



Source: Pizzano & Co., Woburn, Mass.

CW Chart: Tom Monahan

NEXT WEEK

A "hands-on" chief executive officer at Spencer Gifts gets as involved with systems as he does with operations. Manager's Journal explains how **John Hacala** and **Eugene Murtha**, VP of information services, are creating an integrated system aimed at giving corporate decision-makers up-to-the-minute information on sales trends.

Reinhold Spiegler

What sorts of people will be needed to create the kind of trimmed-down, fast-reflex IS staff most companies seem to be seeking? Sensitive techies should definitely apply. And those who know their way around personal computer programming environments and the stocks page will have an edge. For more detail, check Executive Report.

INSIDE LINES

Not so Excel-lent?

"I'm really surprised at how little Microsoft has done," said a source who has played with a beta-test version of Microsoft's Excel 3.0. Beta Excel remains one-dimensional, sports a hard-to-use solver and still does not allow users to print out a list of formulas. One nice feature, however, is a spreadsheet outliner, which allows users to collapse and expand things.

Who's on first

An information systems staffer for a large West Coast firm explains why they have not been able to fulfill a plan to replace a homegrown personnel system with an off-the-shelf package: "We don't know what's in our system, so we don't know the requirements for what we need. We're looking at the old system line-by-line and trying to figure it out as best we can."

The battleship turns

Earl Wheeler, IBM's programming systems chief, hinted last week that IBM is working hard to connect the diverse worlds of Unix and its proprietary operating systems. At a breakfast to commemorate the publishing of a book about Systems Application Architecture, Wheeler said a sequel about distributed and cooperative processing with SAA and Unix should be done speedily — "or else it might be too late."

Come home to Papa

Dun & Bradstreet Software has put out its vision of the future of software applications, and now it appears the firm may be homing in on a visionary. D&B Software Chief John Imlay and veteran industry developer and executive John B. Landry have confirmed that negotiations are afoot for the return of Landry, whose Millenium software line drove D&B Software forerunner McCormack & Dodge to its early 1980s heights.

In living color

While IBM was officially saying the products in the Future Vision sector of its Comdex booth weren't likely to be available for 12 to 18 months, one of them — the laptop with a color screen — looks to hit the streets in April 1991, according to an IBMer. Furthermore, Will Fastie, editor of "The Fastie Report," said the screens on display were direct from the pilot production line, not the lab, lending strength to an April ship date. Fastie added that a color screen on the Personal System/70 would likely raise the price by less than $2,000.

Friendly adversaries

U.S. Justice Department officials recommended a downward departure from sentencing guidelines in the case of Adam E. Grant, Franklin E. Darden Jr. and Robert J. Riggs, the three hackers sentenced in Atlanta last week for a series of computer crimes, citing their cooperation. The three hackers met with law enforcers and Bellsouth security agents on several occasions and provided evidence to prosecute fellow Legion of Doom members. Late last week, an unnamed security expert warned print and radio media that hackers were preparing to mount an attack on telecommunications systems as a form of protest over the sentencing of the three hackers.

Behind the curtains

Lotus lifted the curtain on 1-2-3 for the Apple Macintosh and 1-2-3/W for Windows behind the scenes at Comdex last week. To reports that Lotus compromised the Windows 3.0 interface to accommodate backwards compatibility with character-based versions of 1-2-3, a mostly mute Frank King responded, "It's an interface that Bill Gates himself would love." A source who got a peek at 1-2-3/W says it's looking good.

Our reporters give the award for cheesiest Comdex promo stunt to disk drive maker Micropolis Corp. The firm enlisted Las Vegas cab drivers to ask passengers: "Who makes the fastest hard disk drive?" No matter what the rider replied, back came the authoritative answer: "Micropolis." If the passenger happened to be a designated Micropolis employee, the cabbie picked up $100. One cabbie reported he'd asked 48 passengers but had yet to strike it rich. If you saw something our guys missed, call News Editor Pete Bartolik at (800) 343-6474, message COMPUTERWORLD on MCI Mail, or fax offending documents to (508) 875-8931.

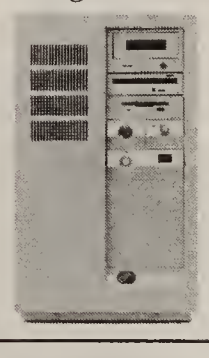
Look out! It's a monster.

Here it comes. The IBM RISC System/6000™ POWERstation and POWERserver 550. Huge performance at a price that won't scare anybody.

Talk about a screamer. The RISC System/6000 POWERstation and POWERserver 550 with AIX® are the newest, most powerful members of the already formidable RISC System/6000 family, delivering 56* MIPS and 23 MFLOPS. That's the kind of number-crunching performance you'd expect from a mini supercomputer costing more than four times as much. And they loom even larger over other UNIX®-based workstations in their own price range.

	Hardware Price	MFLOPS	Cost Per MFLOP
POWERserver 550	$138,000	23.0	$6,000
CONVEX™ C210	$650,000	17.0	$38,235
SPARCserver™ 490	$99,900	3.8	$26,289

Part of what makes this performance possible is a new version of FORTRAN, an innovation for the entire RISC System/6000 family. It's a new FORTRAN optimizing preprocessor that can increase performance up to 25% for users programming in the new FORTRAN version. Couple this with the super floating point performance of the POWERstation/POWERserver 550's .8 submicron CMOS hardware, and the results are almost frightening.



Memory Of Monstrous Proportions.

IBM is now also offering its 4-megabit memory chip for all RISC System/6000 models. It bumps up the maximum system memory up to four times, to increase system throughput, and places the RISC System/6000 family among the industry leaders in workstation memory.

Create Your Own Monster.

And we haven't forgotten people who are already RISC System/6000 users. Model conversions for POWERstations and POWERservers 520, 530 and 540 to the performance of the POWERstation 550 will be available. So those who went for our cutting-edge performance when we introduced the family can continue to enjoy just that, at an enormously reasonable price.

In fact, the only people who should be scared of this monster are our workstation and mini supercomputer competition. And to them, we have only one thing left to say.

Boo.

To find out more, contact your IBM marketing representative or IBM Business Partner. For literature, call **1 800 IBM-6676, ext. 918.**

For the Power Seeker.

IBM

*Values shown here are the results of test-level systems. While these values should be indicative of generally available systems, no warranties or guarantees are stated or implied by IBM. MFLOPS are the results of the double-precision, FORTRAN Linpack 100x100 test. AIX XL FORTRAN Compiler/6000 Version 2 was used. The Dhrystone Version 11 test results are used to compute integer MIPS values, where 1,757 Dhrystones/second is 1 MIPS(VAX™ 11/780). All performance data are based on published benchmarks and hardware prices are current at publication.

IBM and AIX are registered trademarks and RISC System/6000 is a trademark of International Business Machines Corporation. UNIX is a registered trademark of UNIX Systems Laboratories. VAX is a trademark of Digital Equipment Corporation. CONVEX is a trademark of Convex Computer Corporation. SPARCserver is a trademark of Sun Microsystems. © 1990 IBM Corp.

Occasionally, Mergers Produce Results That Either Party Would Find Impossible To Produce On Their Own.

It's not surprising that two can sometimes accomplish things that one never could. What is surprising, however, is just how beneficial the merger of McCormack & Dodge and Management Science America (MSA) promises to be.

Together they are combining their talents and energies, along with an unprecedented wealth of experience, to form D&B Software.

On March 1, 1990 MSA Software Merged With McCormack & Dodge To Become Dun & Bradstreet Software.

With more than one-third of the staff committed to servicing and enhancing your existing software, D&B Software will thoroughly protect your investment. And the company works with more than 10,000 customers worldwide. That means unmatched proficiency in dealing with problems, and knowing what works and what doesn't. While raising customer satisfaction to new heights.

The merger will have unexpected benefits in other ways as well. The R&D budgets and expertise of the two companies are now combined. So you can be assured that D&B Software is extraordinarily equipped to help you navigate the tremendous technological changes that lie ahead. Doing so by enhancing current products. And by providing clear migration paths to the next generation of software.

MSA The Software Company®

D&B Software will also make certain you aren't left behind in an increasingly global marketplace. Because, with the resources of two companies, your needs can now be attended to in more than 60 countries with a network of seasoned company representatives. And the software solutions themselves are designed to operate worldwide and on multiple hardware platforms.

McCormack & Dodge

D&B Software is the largest applications software and services company in the world. With the biggest capacity for doing whatever the customer requires. And doing business with a stable, reliable company such as D&B Software, with the full backing of The Dun & Bradstreet Corporation, will allow customers to do something they've always wanted to do. To concern themselves less with their software and more with the business at hand. D&B Software. The happy result of a merger. And living proof that when two become one, extraordinary things can happen.

For more information about a most welcome addition to the world of software, call (404) 239-INFO.

D&B SOFTWARE